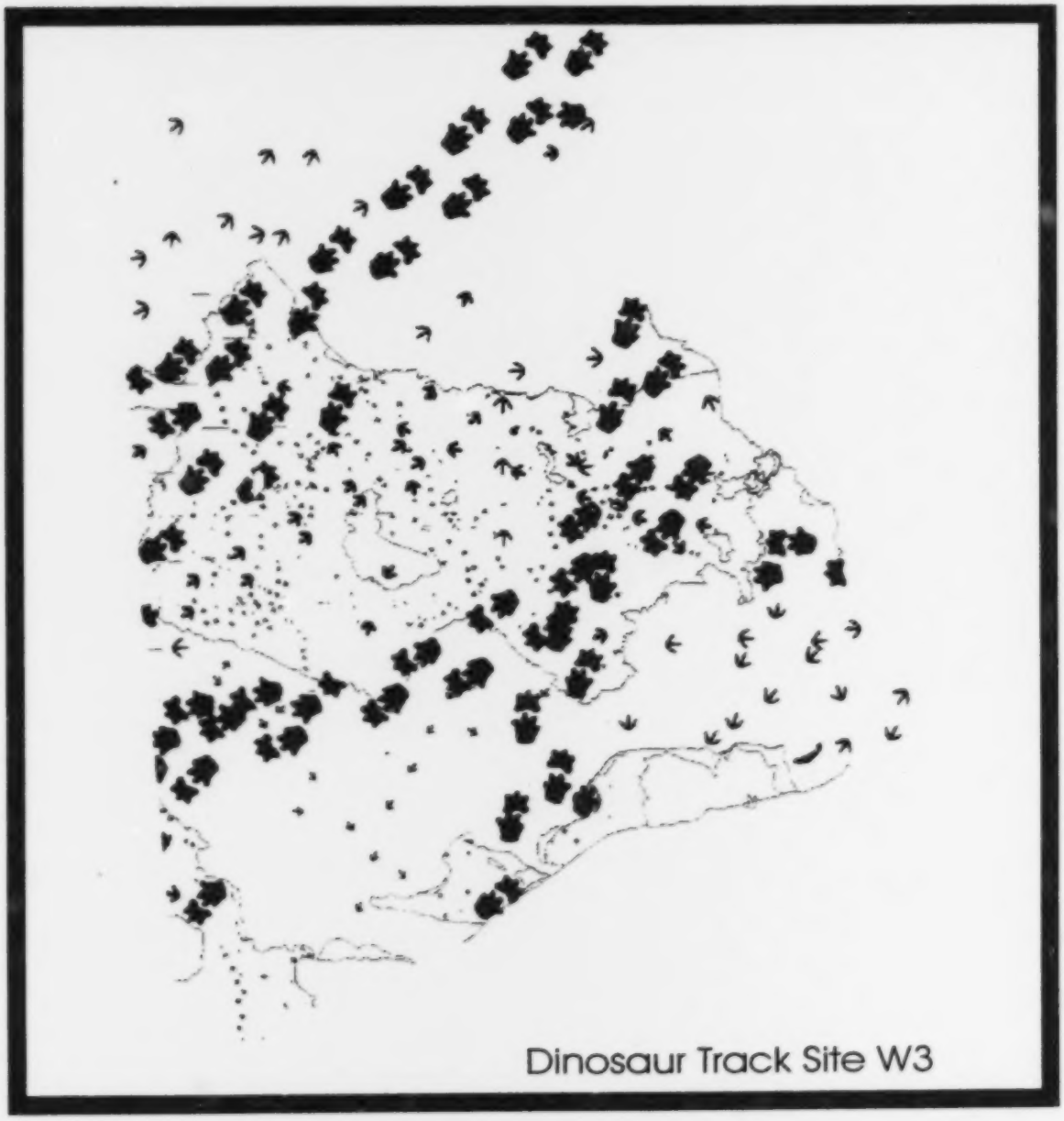
Tourism Opportunity Analysis:
Dinosaur Tracks in the Grande Cache Area



Dinosaur Track Site W3

March 2001

Alberta
ECONOMIC DEVELOPMENT

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TO WHOM IT MAY CONCERN

Alberta Economic Development commissioned this study, titled *Tourism Opportunity Analysis – Dinosaur Tracks in the Grande Cache Area.*

The study examined the capacity of the dinosaur tracks and related palaeontological resources within the Grande Cache region to be developed as a marketable tourism product.

This independent consultant's report was commissioned solely to provide information to Alberta Economic Development for their consideration and does not represent the views or policy of the Alberta Government.

The Government of Alberta disclaims any liability in negligence or otherwise for any loss or damage, which may occur as a result of reliance upon the material contained in this report.

If you have any comments relative to this report, please contact:

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TOURISM OPPORTUNITY ANALYSIS:

DINOSAUR TRACKS IN THE GRANDE CACHE AREA

Presented to

Alberta Economic Development

By

Strategy Plus

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March 2001

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EXECUTIVE SUMMARY

Several sites of dinosaur footprints and trackways have been exposed on provincial Crown lands near the Town of Grande Cache in northwest Alberta, in an area that was formerly part of a coal mine operated by Smoky River Coal Ltd. (SRCL). While no dispositions or mining leases currently exist on the track sites, coal mining applications will be considered in the area over the next few years.

The purpose of this study, commissioned by Alberta Economic Development, is twofold:

1. To determine the capacity of the dinosaur tracks and related palaeontological resources within the Grande Cache region to be developed as marketable tourism products, and
2. If capacity exists to develop the resource as a marketable tourist attraction, to develop an implementation plan for use by interested parties in Grande Cache to pursue development of tourism products and programs related to the dinosaur footprints and trackways.

The study involved several components, including: an assessment of the scientific significance of the track sites; a survey of other sites to determine their best practices; a review and assessment of resource protection, management and access considerations; an inventory and assessment of existing tourism in the area; and an assessment of the tourism potential of the track sites based in part on the experiences of other sites. Several possible tourism scenarios are presented, along with a detailed implementation strategy.

Eighteen track sites have been identified to date, half of which have some tourism potential. More footprints and trackways may potentially be unearthed if surface mining resumes. Footprints from known track sites are estimated to number in the tens of thousands. In addition to the dinosaur track sites, numerous specimens of plant fossils are exposed in the area.

These footprints and trackways are exposed on steep rock walls, many of which are over 60 or 70 meters high. The tracks are quite spectacular under proper light conditions. Many can be viewed from the haul road, with some right beside the road and others from 75 to 150 meters away. A majority of track sites in the world show only partial trackways or are located on flat surfaces, making viewing difficult for the public. Having several thousand footprints visible on the footwalls is a condition rarely seen on this scale. Over time, natural forces will destroy the tracks, although some may survive for several generations if human disturbance is prevented. As tracks slough off slopes or become less distinct, other tracks may emerge from beneath the successive layers of sandstones and mudstones of the Gates Formation in which they are found.

Key findings and recommendations of the study include:

- The dinosaur footprints and trackways are scientifically significant in a North American and international context. Of the eighteen sites identified to date, nine are located close to existing coal haul roads and of high enough quality to be included as part of a guided tour.

- The track sites, together with other resources in the Grande Cache area, satisfy several criteria required for determining tourism significance, including uniqueness, opportunities for interpretive programming, availability of other tourism attractions and services, local interest, success of similar attractions elsewhere, and potential linkages with other related attractions.

- Guided tours provided by a local Grande Cache group as a controlled access tourism product, with limited development at the track sites, is recommended. The experience would include a three to four hour guided bus tour to the track sites using a twenty-passenger vehicle appropriately equipped with heavy duty suspension and multi-wheel drive.

- The Grande Cache Visitor Centre would provide an offsite interpretive experience and a staging point for tours. New and upgraded displays, as well as interpretive programming, are recommended. Onsite development (on a phased basis), may include fencing, viewpoints, walkways, turn around areas, wind shelters, portable toilets, and lighting for improved daytime viewing and special evening programs.

- Guided bus tours would operate primarily in the summer season (June 15 to September 15). Led by trained and certified guides delivering a professionally developed interpretive program, bus tours would cost a minimum of $25 to $30 per person. Based on operating at an estimated 40% capacity with one tour per day for the first year or two, attendance would be in the range of 750 to 1000 visitors/year. Visitation could vary, depending on such factors as number of tours per day and per season, as well as marketing and promotional initiatives.

- Other similar attractions note that guided tours to a remote location to see dinosaur track sites will be of interest to a wide range of visitors. In the longer term, it should be possible to attract larger numbers of visitors, as is demonstrated by visitation in 2000 at such other sites as: Yoho Burgess Shale in British Columbia (1,275), Copper Ridge Dinosaur Tracks in Utah (6,044), T-Rex Discovery Centre in Saskatchewan (7,000), Dinosaur Depot Museum in Colorado (15,608), Red Gulch Dinosaur Tracks in Wyoming (18,000), and Dinosaur Ridge in Colorado (40,000).

- A non-profit society, such as the "Friends of the Dinosaur Tracks Society", should be formed locally to take the lead role in developing and managing the tourism product and programming. While services may be provided through contracted operators, a non-profit society will ensure that the dinosaur tracks tours remain a local undertaking and benefit the community. It will also provide an entity for fund raising and volunteer participation. Development of a tourism product such as this will require the long term commitment of a number of individuals who are prepared to provide time and energy over several years to help to make this a sustainable, thriving business.

- A pilot tour program, including contracted use of a bus or van and a professionally developed interpretive program, should be initiated in the summer of 2001. This pilot program should be designed to test the market and operational factors, and provide a basis on which to develop detailed business, operational, facility development, and marketing plans for the tour product.

- The track sites are located on Provincial Crown land zoned as "multiple use" within a former coal mine area. While the area of the track sites is currently being reclaimed, applications are being developed relative to resource extractive activity in the surrounding area. Tourism operations will need to be able to co-exist with other resource uses in the longer term.

- A protective notation placed on the track sites in the short term by Alberta Community Development, followed by designation as a Provincial Historic Resource (PHR), is critical in terms of effectively protecting the track sites for future visitor use and enjoyment.

- Safe, reliable and affordable access to the resource is a critical prerequisite for any onsite tourism product. Vehicular access to the area is possible along roads that were developed as coal haul roads and that are currently the responsibility of the Alberta government. It would be cost prohibitive for a tourism operator to assume responsibility for maintenance and reclamation of these roads independently. It is recommended that short term letters of authority be arranged with Alberta Sustainable Resource Development until other resource uses and responsibility for road maintenance are resolved over the next year or two. When that occurs, it should be possible to negotiate a "consent' agreement with the resource company/companies to use the road on a controlled basis for bus tours to the track sites.

- Once coal mining operations resume in the area, loaded mining trucks will use the same roads as tour vehicles, creating dust, noise, and potential safety and liability concerns. In order for both mining and tourism operations to safely co-exist, it will be essential to negotiate agreements in terms of required insurance and indemnity, as well as how tour vehicles will safely operate within the active mining area (e.g., schedules, radio control, pull off areas). In addition, protective clothing (e.g., boots, coveralls, goggles, and hard hats) may be required.

- When access is resolved, it will be possible to apply to the Alberta government for a disposition on the track sites that will allow for the limited development noted above. This application would address such components as access, liability and indemnity concerns, an operations plan, and a proposed development plan on a phased basis.

A detailed implementation strategy is provided in the report that outlines the key actions, timelines, responsibilities and order of magnitude costs for developing guided bus tours to the track sites on a controlled access basis, with limited development of facilities onsite and enhancement of the Visitor Centre.

103-07037/

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1. BACKGROUND AND STUDY PURPOSE

Several sites of dinosaur footprints and trackways have been exposed on provincial Crown lands near the Town of Grande Cache in northwest Alberta. This area of Crown land was formerly leased by Smoky River Coal Ltd. (SRCL), but reverted to the Crown after the company went through receivership in 2000. Grande Cache Coal Company Inc. (GCC) is currently developing a proposal to re-establish a coal mine in part of the former SRCL mine site. Other resource uses are also being considered in the area.

Other plant fossil resources have also been documented within the region, many in the same areas as the dinosaur footprints and trackways (Wan, 1996). When there was active coal mining in the area, limited access for guided tours to view the mine and the dinosaur tracks was provided by SRCL. Since the closure of the mine, access is only available by special arrangement through Alberta Sustainable Resource Development.

Interest has been expressed locally about the potential for developing these resources as a tourism attraction. A small display area, including a cast specimen of some footprints as well as other fossils, is located at the Grande Cache Visitor Information Centre. This has led to increased awareness of, and interest in visiting, the track sites; however, viewing of the actual resource onsite is presently not available.

1.1. STUDY PURPOSE

The purpose of this study, commissioned by Alberta Economic Development, is twofold:

1. To determine the capacity of the dinosaur tracks and related palaeontological resources within the Grande Cache region to be developed as marketable tourism products, and
2. If it is determined that capacity exists to develop the resource as a marketable tourist attraction, to develop an implementation plan for use by interested parties in the community of Grande Cache to pursue development of tourism products and programs related to the dinosaur footprints and trackways.

1.2. STUDY COMPONENTS

This tourism opportunity analysis involved the following components:

1. Review and assessment of resource protection and management requirements and implications in relation to tourism opportunities and activities involving the dinosaur track sites. This included clarifying the government administrative context, as well as contacting resource companies to determine the requirements for dinosaur track site tours to safely co-exist with future coal mining and other resource extractive activities in the area. Four principal needs were assessed:
   - Effective and sustained protection for the dinosaur footprints and trackways,
   - Safe, reliable and affordable access,
   - Short and long-term land tenure/disposition, and
   - Assured public safety and associated liability risks.

2. Survey of other dinosaur and palaeontological sites in Western North America, including documenting best practices related to such things as resource management and protection, funding, marketing, and merchandizing.

3. Review and assessment of the scientific significance of the Grande Cache dinosaur footprints and trackways in a North America and global context.

4. Inventory and review of existing tourism products and activity in the Grande Cache area, and assessment of the tourism marketability of the dinosaur track sites, based on local information as well as the experience of other related sites.

5. Identification of optional scenarios for Grande Cache, as well as conclusions and recommendations regarding possible tourism products involving the dinosaur trackways.

6. Preparation of a detailed implementation strategy relative to actions, timelines, responsibilities and order of magnitude costs required to implement the preferred scenario.

2. DESCRIPTION OF STUDY AREA AND RESOURCES

2.1. REGIONAL SETTING

The Town of Grande Cache is located in northwest Alberta, north of Jasper National Park and at the north end of Willmore Wilderness Park, within the Municipal District of Greenview No. 16. It is situated on Highway 40, the Big Horn Highway, about midway between the Yellowhead Highway to the south and Highway 43 to the north. The Town of Hinton lies 143 km to the south, and the City of Grande Prairie is 182 km to the north. Highway 40 provides part of the paved connection between the Yellowhead Highway and Mile Zero of the Alaska Highway at Dawson Creek, B.C.

Since completion of the paving of Highway 40 in 1996, there has been an increase in traffic along the highway, including travelers passing through the area on their way to or from Alaska. Highway 40 forms part of the shortest route to and from Alaska for travelers using the scenic Icefields Parkway through Banff and Jasper National Parks.

The economy of Grande Cache is based on forest products, oil, natural gas, coal, correctional services, electrical production, and tourism and recreation.

The area is richly endowed with scenic resources and extensive recreation and tourism opportunities. Grande Cache is the major service centre in the area, providing a range of services. It is located adjacent to Willmore Wilderness Park, acting as the northern gateway for access to the park. It is also surrounded by Crown land, providing such opportunities as wildlife viewing, hiking, horseback riding, white water rafting and kayaking, all-terrain vehicle use, hunting, and fishing.

2.2. LOCATION AND GENERAL DESCRIPTION OF DINOSAUR TRACK SITES

Track sites with footprints of dinosaurs and other terrestrial vertebrates are found north of the Town of Grande Cache in what formerly was the SRCL mine site. Footprints and trackways were exposed on surface footwalls upon the removal of coal from the Number Four coal seam in the Grande Cache Member of the Gates Formation (Lower Cretaceous, Lower Albian). Many of the track sites are situated on nearly vertical slopes over 60 or 70 meters high, and are quite spectacular under proper light conditions.

Map 1 identifies the location of Grande Cache in a regional context, as well as highlights the former SRCL mine site in which the dinosaur track sites are located.

After being notified of the existence of the dinosaur footprints and trackways in 1989, research expeditions were sent by the Royal Tyrrell Museum of Palaeontology to collect footprint specimens and data. SRCL cooperated in these studies by granting access to the track sites, most of which are located near active haul roads within the mine area.

During the course of this research, eighteen track sites were discovered and there was potential for more to be unearthed as a result of continued surface mining of coal in the area. Footprints from all of these track sites are estimated to number in the tens of thousands, with one track site alone (W3 Main) having approximately 10,000 footprints. The diversity of footprint types is relatively high, with four ichnogenera (trace fossil genera) of theropod footprints (*Irenesauripus mclearni*, *Columbosauripus ungulatus*, *Gypsichnites pascensis* and *Irenichnites gracilis*), one ichnogenus of ankylosaur footprints (*Tetrapodosaurus borealis*), and at least three ichnogenera of avian footprints (*Aquatilavipes* ichnospecies).

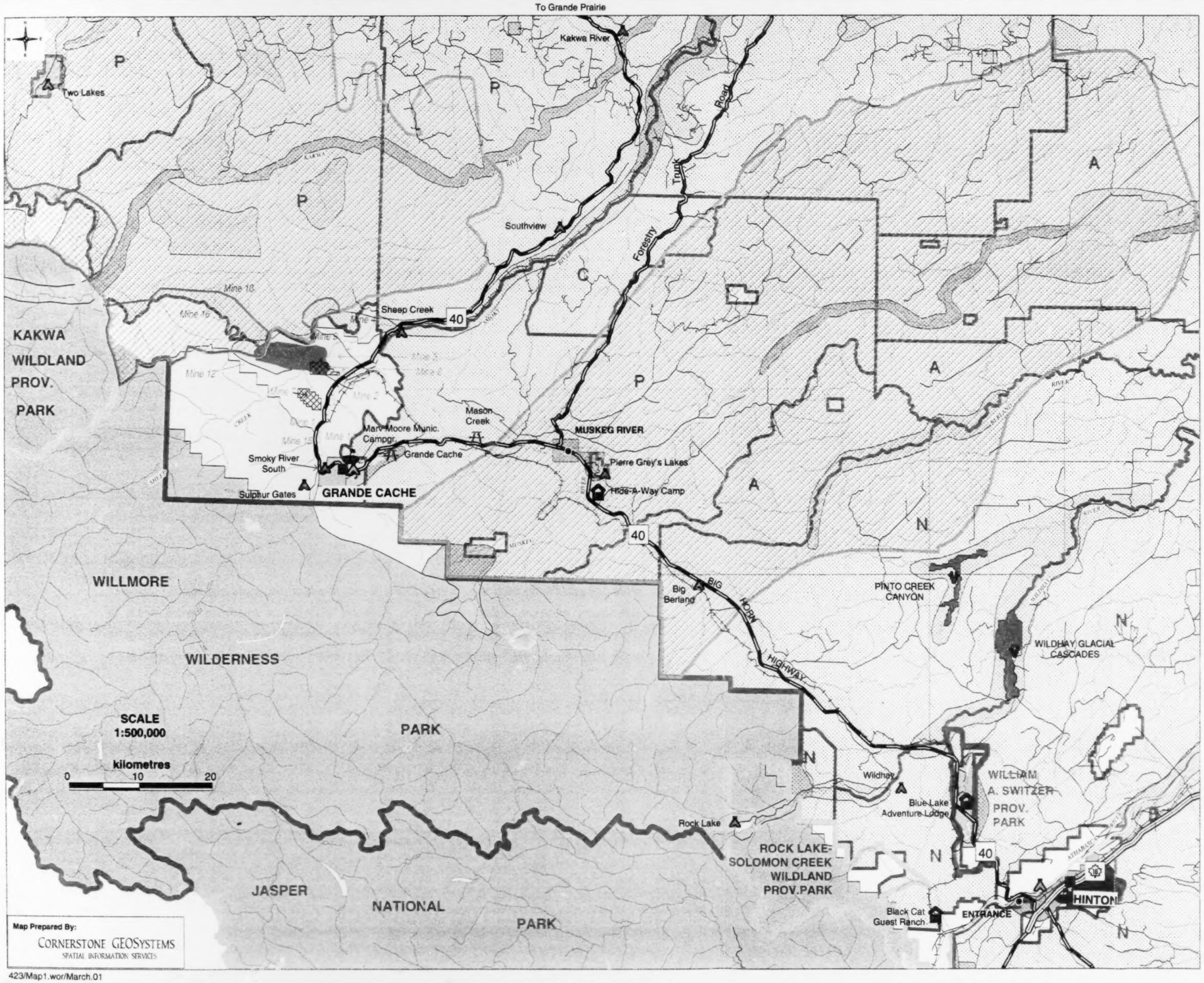
In addition to the dinosaur track sites, numerous specimens of plant fossils were documented in the adjacent areas (Wan, 1996). Attempts were made during the course of this Tourism Opportunity Analysis to identify any other published evidence of palaeontological resources in the area. No significant resources in the immediate area were identified; however, it is possible that additional resources may be identified in future that would add to the tourism potential of the area.

The primary researcher for much of the work undertaken relative to the dinosaur footprints and trackways in the area has been Richard T. McCrea, a graduate student in palaeontology in the Department of Earth and Atmospheric Sciences at the University of Alberta who is currently completing a PhD on the subject. McCrea has participated on the consulting team for this report, and his findings are incorporated.

While SRCL is no longer active in the area, access to the dinosaur track sites is still restricted, and the entire site is under control of the Provincial Crown. A portion of the main haul road will be required by the Grande Cache Coal Company Inc. (GCC) for access to Numbers 7 and 8 mine areas. This company is currently undertaking an Environmental Impact Assessment relative to further mining activity in the area. Other companies are also actively considering access to the area for other resource uses. The dinosaur track sites are located on Provincial Crown land outside of this lease area in an area that is undergoing reclamation. Access to the track sites is via a former mine road with a locked gate, currently controlled by Alberta Sustainable Resource Development. Special arrangements must be made with the local land manager in order to have access to the area.

MAP 1. DINOSAUR TRACK SITES IN THE GRANDE CACHE AREA

SCALE 1:500 000



LEGEND

- TOWNS
- LOCALITIES
- RIVERS / STREAMS
- LAKES
- PRIMARY DIVIDED HIGHWAYS
- PRIMARY PAVED ROADS
- SECONDARY ROADS
- TRUCK, FOREST TRAILS AND OTHER ACCESS ROADS
- RAIL LINES

DINOSAUR TRACK SITES STUDY AREA

NATIONAL PARKS

PROVINCIAL PARKS AND PROTECTED AREAS:

- PROVINCIAL PARKS/ WILLMORE WILDERNESS PARK
- NATURAL AREAS
- WILDLAND PARKS
- RECREATION AREAS

OTHER TOURISM FACILITIES

- CAMPGROUNDS
- GOLF COURSES
- LODGES
- DAY USE AREAS

WILDLIFE PROTECTION AREAS

- CARIBOU PROTECTION AREAS
- GOAT-SHEEP AREAS

EASTERN SLOPES RESOURCE MANAGEMENT ZONES:

- PRIME PROTECTION
- CRITICAL WILDLIFE
- SPECIAL USE
- GENERAL RECREATION
- INDUSTRIAL
- FACILITY
- MULTIPLE USE

COAL LEASE

FOREST MANAGEMENT AGREEMENT AREAS:

- A ANC TIMBER LTD.
- C CANADIAN FOREST PRODUCTS LTD.
- N WELDWOOD OF CANADA LTD
- P WEYERHAEUSER CANADA LTD (GRANDE PRAIRIE)

Map Prepared By:
CORNERSTONE GEOSYSTEMS
SPATIAL INFORMATION SERVICES

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MAP 1. DINOSAUR TRACK SITES IN THE GRANDE CACHE AREA

SCALE 1:500,000

SCALE
1:500,000

Kilometres

LEGEND

TOWNS
LOCALITIES
RIVERS / STREAMS
LAKES
PRIMARY DIVIDED HIGHWAYS
PRIMARY PAVED ROADS
SECONDARY ROADS
TRUCK, FOREST TRAILS AND OTHER ACCESS ROADS
RAIL LINES

DINOSAUR TRACK SITES
STUDY AREA

NATIONAL PARKS

PROVINCIAL PARKS AND PROTECTED AREAS:
PROVINCIAL PARKS
WILLMORE WILDERNESS PARK
NATURAL AREAS
WILDLAND PARKS
RECREATION AREAS

OTHER TOURISM FACILITIES
CAMPGROUNDS
GOLF COURSES
LODGES
DAY USE AREAS

WILDLIFE PROTECTION AREAS
CARIBOU PROTECTION AREAS
OTHER SPECIES AREAS

EASTERN SLOPES
RESOURCE MANAGEMENT ZONES
WILDERNESS
BACKCOUNTRY
SPECIAL USE
GENERAL MULTIPLE USE
NATURAL
RECREATION
MULTIPLE USE

COAL LEASE

FOREST MANAGEMENT AGREEMENT AREAS
WEYERHAEUSER
CANADIAN FOREST PRODUCTS
ALBERTA FOREST PRODUCTS
MACMILLAN BLOEDEL
DAISHOWA
OTHER
UNDER NEGOTIATION

Alberta

2.3. INVENTORY OF TOURISM AND RECREATION FACILITIES AND SERVICES

2.3.1. Tourism and Recreation Attractions and Facilities

Table 1 identifies tourism and recreation facilities in or near the Town of Grande Cache

TABLE 1: TOURISM AND RECREATION FACILITIES AND SERVICES

Recreation Facility/Service	Activity	Location
Grande Cache Tourism and Interpretive Centre	Visitor Information. Cultural and natural history displays, exhibits by local artists, gift shop. Opened 1996.	On Hwy 40 at south entrance to Town. Open year round.
Grande Cache Golf & Country Club	9 hole golf course and full facilities	Just north of town, off Hwy 40
Akasaka Recreation Centre	Swimming pool, arena, curling rink, fitness centre, tennis courts, ball diamonds, soccer fields	In town.
Hide-A-Way Camp	Main lodge and 6 cabins, sleeping up to 6 adults and 2 children each	Pierre Grey's Lake, 32 km south on Hwy 40
Willmore Wilderness Park	Extensive backcountry, trail riding	Adjacent to town.
Mason Creek Day Use Area	Picnic area	East on Highway 40
Grande Cache Lake Day Use Area	Picnic area, swimming beach, fishing, water skiing	East on Highway 40
Fireman's Park Picnic Area	Picnic area	In town.
Victor Lake	fishing and canoeing	East of town.
Griffith Trail	10 km trail for hiking, biking	Trail circles town.
Sulphur Rim Trail	7 km walking path	Along Sulphur Rim Canyon
Twin Falls Trail	1 km walking trail	To Hells Creek & Twin Falls

Source: Grande Cache Website; brochures; and Town of Grande Cache: Tourism Development and Retiree Attraction Strategy; Ference Weicker & Company; September 2000

2.3.2. Tour Operators

In 2000, 11 tour operators provided services in the Grande Cache area (see Table 2). Most of these were adventure and activity oriented, with only a couple providing interpretive programming as part of the experience. Two of the tour operators were from outside the immediate area, with one of these offering an opportunity to visit the track sites as part of the tour.

TABLE 2: TOUR OPERATORS

Operator	Service Provided
Taste of Wilderness Tours	Guided hiking/backpacking trips, emphasize local history & culture, nature interpretation and appreciation, environmental awareness
Wild Blue Yonder	River outfitter, rafting & canoeing on Smoky and Sulphur Rivers & local lakes, trail riding and hiking in Willmore Wilderness Park.
Dan's Rafting Tours	Rafting trips on Smoky and Kakwa, raft rentals, fishing, hunting
Avalanche Adventures & Tours	Jet boat tours, hunting & fishing trips, equipment rental
Sheep Creek Backcountry Experience Ltd	Backcountry cabins, horseback riding, fishing, hunting, hiking and snowmobiling
High Country Vacations	Class "A" guide and outfitter, pack trips, "healing journeys"
Sulphur Gates Outfitting	Class "A" guide and outfitter in the Wilmore Wilderness Park
U Bar Enterprises	Trail riding, combination riding and rafting excursions
Wild Hay Adventure Tours	Trail rides, pack trips, photography trips, native & western culture trips
Alta-Can Tours Inc	Coach tours, specializing in Japanese market for fall Aurora Borealis; Edmonton based
Timberwolf Tours Ltd	Adventure Tours, including hiking, animal/bird watching; Sherwood Park based

Source: Grande Cache website, personal communication and Town of Grande Cache: Tourism Development and Retiree Attraction Strategy; Ference Weicker & Company; September 2000, Pg 88/89.

2.3.3. Tourism Accommodation - Fixed Roof (Hotels/Motels/Bed and Breakfast)

- As of September 2000, there were six fixed roof hotel/motel accommodation establishments and two bed and breakfast operations in the town, providing a total of 228 rooms (see Table 3). These properties provide mid-range accommodation, largely used by work crews from resource industries. There are no luxury properties in Grande Cache.
- Ference Weicker & Company reported in 2000 that the hotel and motels have been in operation for an average of 19 years, employing 88 people, many on a part-time and/or seasonal basis. Occupancy rates vary on a seasonal basis and between properties, although an estimated 50% occupancy level represents over 40,000 room rentals per year and over $2 million in room rental revenues for the community.

TABLE 3: FIXED ROOF ACCOMMODATION FACILITIES IN GRANDE CACHE

Name	Type	Units	Restaurant
Acorn Motel	Motel	52	No
Alpine Lodge Motel	Motel	36	Yes
Big Horn Motor Inn	Motel	37	Yes
Grande Cache Hotel	Hotel	48	Yes
Inn on the Valley	Motel	48	No
Misty Mountain Apartments	Apartment	5	No
Mountain Quest Bed & Breakfast	Private Home	1	No
Mount Hamell Bed & Breakfast	Private Home	1	No
Total Fixed Roof Units Available		228	

Source: Town of Grande Cache: Tourism Development and Retiree Attraction Strategy; Ference Weicker & Company; September 2000, Pg 87 and Grande Cache website

2.3.4. Tourism Accommodation – Campgrounds

- The Marv Moore Municipal Campground is the only serviced campground in the area, while several other campgrounds provide basic services (See Table 4).
- In the summer of 1999, there were 3,800 visitors to the Marv Moore Municipal Campground, originating from: Alberta (69.8%), British Columbia (14.2%), United States (9.5%), Other Canada (3.7%), and International (2.8%).

TABLE 4: CAMPGROUNDS IN THE VICINITY OF GRANDE CACHE

Name	Sites	Distance from Town
Marv Moore Municipal Campground (serviced)	77	In town
Smoky River South Forestry Provincial Recreation Area	22	3 km N on Hwy 40
Sulphur Gates Forestry Provincial Recreation Area, Staging Area and Campground	12	5.5 km N on Hwy 40/7.5 km SW
Sheep Creek Forestry Provincial Recreation Area	9	20 km N on Hwy 40
Pierre Grey's Lake Provincial Recreation Area	101	32 km E on Hwy 40
Big Berland Forestry Provincial Recreation Area	20	60 km SE on Hwy 40
Kakwa River Forestry Provincial Recreation Area	14	80 km NE on Hwy 40

Source: Town of Grande Cache: Tourism Development and Retiree Attraction Strategy; Ference Weicker & Company; September 2000, Pg 88

2.3.5. Transportation Services

- The Bighorn Highway 40 is the main route connecting Grande Cache with Hinton and the Yellowhead Highway 16 in the south and with Grande Prairie in the north
- The Grande Cache Municipal Airport, 19 km east of town, has a 5000 meter runway and operates on a 24 hour basis. There is currently no scheduled service. The airport handles charter and emergency services.
- A rail line situated near Grande Cache provides transport for coal and commodities.
- Greyhound bus service 6 days/week to Hinton and 5 days/week to Grande Prairie, along with charter bus service, is provided by a local company (Trax)
- There is local taxi service provided by Grande Cache Taxi.

2.3.6. Other Services

- Grande Cache General Hospital offers 24 hour emergency care
- 14 restaurants and take out food services, three of which are located in a hotel or motel.
- 5 grocery/convenience stores, 2 liquor stores and 11 souvenir and craft stores
- Range of automotive service facilities
- H & R Rentals rents snowmobiles and quads with or without guided tours.

2.3.7. Selected Special Annual Events

- Rocky Mountain Children's Festival, 1st week in May
- Music Festival, 2nd week in May
- Wild River Rendezvous, 2nd weekend in June
- Aboriginal Cultural Days
- Canadian Death Run, extreme foot race, August long weekend
- Canadian Death Race, extreme mountain bike race, September long weekend
- Mud Bog Challenge, August
- Canadian Death Snowshoe Race, beginning in 2002
- Passport to the Peaks, encouraging participants in the program to climb the 21 peaks around the Town of Grande Cache, ongoing

2.4. TOURISM VISITATION IN THE GRANDE CACHE AREA

2.4.1. Visitor Statistics

Grande Cache is located within the Canadian Rockies Tourism Destination Region (TDR), cooperating with Hinton, Canmore, and Banff and Jasper National Parks in marketing initiatives. However, when considering current visitor use patterns and statistics (e.g., users of the hotel rooms in Grande Cache are primarily industrial crews and business travelers rather than tourists or tour groups), Grande Cache is perhaps more appropriately considered in the context of visitation to the Alberta North Tourism Destination Region, the boundary of which is just to the north of the Town. Some statistics regarding visitor use in the surrounding Alberta North Tourism Destination Region are presented below, and other tables are included in Appendix C.

- In 1999, 1.5 million people included Alberta North in their travels. This represents approximately 7% of the total 21.5 million visits made in and to Alberta.

- Visitors who included Alberta North as part of their trip spent $242 million on their entire trip. They had a slightly higher tendency to overnight on their trip than did visitors to other regions of the province (52.3% vs 47.7%). Their purpose of trip tended to be to visit friends/relatives (18.9%), compared to pleasure (16.0%).

- In 1999, approximately 10% of Alberta's 661 fixed-roof accommodation properties and 9% of the rooms were located in Alberta North. The average establishment had 69.4 rooms, an average occupancy rate of 64.8%, with an average room rate of $41.40.

- The source of room demand for Alberta North is significantly different from the provincial average in that industrial crews and business travelers account for most room nights. Industrial crews accounted for 36.7% in 1997, growing to 40.8% in 1999. Business travelers declined slightly from 40.5% in 1997 to 37.6% in 1999.

- The source of room demand also differs in the Canadian Rockies, where tourists (39.8%) and tour groups (38.1%) account for most of the demand (See Table 5).

TABLE 5: SOURCE OF ROOM DEMAND 1999

Region	Industrial Crews (%)	Business Travelers (%)	Tourists (%)	Tour Groups (%)	Convention Groups (%)	Other (%)
Alberta North	40.8	37.6	9.3	1.8	3.3	7.1
Alberta Central	42.6	24.9	14.4	1.6	4.2	2.3
Edmonton & Area	8.7	43.1	22.1	3.7	12.2	0.1
Canadian Rockies	0.8	1.9	39.8	38.1	17.7	1.6
Calgary and Area	7.3	42.6	28.6	7.1	9.9	4.5
Alberta South	41.5	22.6	24.7	2.6	2.5	6.8
Total Alberta	18.0	29.0	24.9	11.1	10.0	7.0

Source: Alberta Economic Development

2.4.2. Reason for Visit to Grande Cache

In the "Town of Grande Cache: Tourism Development and Retiree Attraction Strategy" study, businesses were asked what visitors indicated was their reason for visiting Grande Cache (See Table 6). People traveling on business are the primary users of accommodation (76%), followed by people traveling through on the highway (16%). The majority of people participating in adventure activities identify Grande Cache as their primary destination (68%), while 19% were traveling through the area and 10% were visiting friends and relatives.

TABLE 6: REASON FOR VISIT

Reason for Visit	Accommodation (%)	Adventure (%)
Traveling through by automobile	16	19
Visiting friends and relatives	5	10
Traveling to the Grande Cache area on business	76	3
Visiting Grande Cache as their primary destination	3	68
Total	100	100

Source: Town of Grande Cache: Tourism Development and Retiree Attraction Strategy; Ference Weicker & Company; September 2000. Pg 92

The survey also asked businesses to identify the percentage of their revenue in terms of visitor origin. Accommodation operators felt that the majority (62%) of their visitor revenues came from the rest of Alberta, 23% from the local area, and 11% from Other Canada, with 2% each from the United States and other countries. Outdoor adventure operators felt that the majority of their revenues came from visitors from the rest of Alberta (43%), followed by the rest of Canada (27%), the United States (16%), other countries (8%) and the local area (6%). All other businesses surveyed felt their revenues came from users living within the Grande Cache area (62%), from the rest of Alberta (24%), the rest of Canada (10%), other countries (3%), and the United States (1%).

2.4.3. Survey of Visitors to Grande Cache

In 2000, Ference Weicker & Company, conducted 111 telephone surveys with visitors to Grande Cache. Of the respondents, 50 were visitors from the United States and 61 were Canadians (39 from Alberta and 22 from B.C.). Highlights of the survey are outlined in the following sections.

2.4.3.1. Visitors from the United States

- 90% of American visitors were traveling to Alaska
- The average length of trip was 48 days, with an average of 2.3 people per party
- For 86% of respondents, it was their first visit to Grande Cache
- Only 20% had planned to stay in Grande Cache before leaving home
- Only 10% participated in outdoor activities during their stay
- 96% would recommend the town as a place to visit.
- Most visitors found out about Grande Cache on their way to the destination (32%), from the Milepost (26%), or by word of mouth (16%)

TABLE 7: HOW AMERICAN VISITORS FOUND OUT ABOUT GRANDE CACHE

	Respondents (#)	Percent (%)
Publications		
Milepost	13	26
AAA	3	6
Good Sam Club	1	2
Brochure	1	2
Other		
On way to destination	16	32
Word of mouth	8	16
Been before	4	8
Map	2	4
Friends/relatives	2	4
Sign	1	2
Information Centre	1	2
Total	*50*	*100*

Source: Town of Grande Cache: Tourism Development and Retiree Attraction Strategy; Ference Weicker & Company; September 2000, Pg 96

- Americans were also asked how satisfied they were with their experience in Grande Cache on a scale of 1 to 5, where 5 is very satisfied and 1 is not at all satisfied. The majority (64%) rated their experience as very satisfied.
- The majority of Alaska bound American travelers (58%) had come through the Banff/Jasper corridor. Another 12% had traveled on the British Columbia/Cassiar route, and 3% had traveled along the Edmonton/Grande Prairie route.

- On the return trip from Alaska, 53% traveled through Grande Cache on Highway 40, 7% took the Grande Prairie/Edmonton route, and 13% traveled through B.C.
- The majority of the travelers (56%) chose to go through Grande Cache on the way north to Alaska, while (42%) went through the area on their way back. Only 2 travelers used this route both ways.
- On their way to Alaska, visitors from the United States averaged about 4 hours a day on the road. Table 8 shows where travelers spent the night before and the night after Grande Cache.

TABLE 8: OVERNIGHT LOCATION BEFORE AND AFTER GRANDE CACHE

Centre	Stayed on way to Grande Cache	Stayed the night after Grande Cache	Distance from Grande Cache (km)
Banff/Lake Louise	10	10	443
Jasper	10	7	214
Dawson Creek	9	15	322
Fort St. John	10	4	401
Calgary	1	2	626
Ft. Nelson	0	1	789

Source: Town of Grande Cache: Tourism Development and Retiree Attraction Strategy; Ference Weicker & Company; September 2000, Pg 117

- When asked what would make US visitors to Grande Cache stay longer, they noted the following activities: scenery/sightseeing/hiking (15 respondents), visiting historical parks and monuments (8 respondents), fishing (8 respondents), being more aware of what was available (5 respondents), and wildlife viewing (5 respondents).

2.4.3.2. Visitors from Canada

- 50% had been in Grande Cache before
- 61% had planned to stay in Grande Cache before leaving home
- 79% only stayed one night
- 46% participated in outdoor activities while in town, including hiking (11 respondents or 18%), golf (10 respondents or 16%), whitewater rafting (2 respondents or 3%), and fishing, wildlife viewing, and biking (1 respondent or 1.6% each)
- The average trip length was 11 days
- 98% would recommend the town as a place to visit
- 79% plan to return to Grande Cache
- The majority (49.2%) of Canadians were traveling to or from other regions
- When asked how satisfied they were with their experience in Grande Cache, the majority (57.4%) indicated very satisfied.

3. RESOURCE PROTECTION AND TOURISM ACTIVITY MANAGEMENT

Opportunities for tourism activities at dinosaur tracks exposed at the former SRCL (Smoky River Coal Limited) coal mine site are dependent on four principal needs:

1. Effective and sustained protection for the dinosaur tracks and trackways;
2. Safe, reliable and affordable access;
3. Short and long-term land tenure (disposition); and
4. Assured public safety and associated liability protection.

This section provides an overview of regional and site resources, and assesses many key issues that will influence decisions about potential tourism activity at the dinosaur track sites.

3.1. OVERVIEW OF NATURAL RESOURCES AND PROTECTION ISSUES

3.1.1. Location and Climate:

The dinosaur tracks at the former SRCL mine site (12-Mine and 9-Mine) are found on recently exposed slabs of steeply inclined sedimentary sandstone at elevations between 1,400 and 1,500 meters above sea level (asl). The area lies within the Rocky Mountain Foothills ecoregion approximately 15 km northwest of Grande Cache and 7 km west of Highway 40, Alberta's "Bighorn" Highway. All tracks were exposed during surface mining operations, which removed a thick, overlying coal seam. Coal mining in this area has ceased and all permits, licenses, approvals, authorities and dispositions previously held by SRCL have been disclaimed back to the Provincial Crown. Future resource exploration and extraction activities are anticipated.

The regional climate is typical of high elevation areas within the Upper (northern) Subregion of Alberta's Foothills Natural Region. Cool winters and moderate summers ensure that Grande Cache enjoys no predictably recurring frost-free period. This area has the highest summer precipitation in Alberta, averaging 340-mm., and mean annual precipitation of 540-mm. Winters are long and often cold. Occasional Chinook winds provide periods of relief from invasions of cold arctic air.

3.1.2. Landscape Elements

In the Grande Cache area, the Alberta Foothills are extensively underlain by sedimentary deposits of clastic (silts, sandstones and conglomerates) or organic (coal) origin. These materials were deposited along the western perimeter and shores of a large inland sea that existed during the Mesozoic Era, specifically during the Jurassic and Cretaceous periods.

Reaching its peak extent nearly 100 million years ago, this inland sea (the Kiowa / Skull Creek Sea) was created at a time when high sea levels allowed the western oceans to flood B.C.'s Rocky Mountain trough and the interior plains. The inland sea stretched from the Arctic Ocean to the Gulf of Mexico, including central and eastern Alberta.

Much of this sedimentary material was deposited prior to and during the first period of Rocky Mountain building, the "Columbian" orogeny (period of uplifting). The Columbian orogeny extended throughout the period from 175 to 100 million years before present, coinciding with the Middle Jurassic and Early Cretaceous periods. During this time, the climate varied considerably, including periods now associated with more tropical climates. Throughout this period of deposition, dinosaurs roamed the margins of the Mesozoic sea, moving up and down its western perimeter. Dinosaur skeletal remains (bones) found in Alberta, Montana and Wyoming are the remains of animals that became trapped and buried by silts and sands washed into the sea by rivers swollen in flood. Dinosaur skeletal remains in Alberta are found in much younger sediments (sediments deposited at least 30 million years more recently) than those in which the Grande Cache dinosaur tracks are found.

Between 85 and 45 million years before present, a second period of active mountain building affected this region. The "Laramide" orogeny, caused by northeasterly pressure resulting from a collision of two geological 'plates' (the North American and Pacific plates), led to the development of the Front Ranges of the Rocky Mountains and the Alberta Foothills. This upward movement of sedimentary and other materials drained the inland sea, and brought an end to depositional processes in what is now the Grande Cache region.

McCrea (2001) reports that the dinosaur tracks found near Grande Cache were made approximately 100 million years ago by animals occupying estuarine, shoreline and swampy habitats on the western perimeter of the inland sea. At that time, these same silty and sandy deposits (Grande Cache Member, Gates Formation) were generally level, but would be squeezed and up thrust by tectonic forces of the Laramide orogeny to create the alternating synclines and anticlines that shape the foothills in this region. A syncline is a down fold in stratified rocks from whose central axis the beds rise upward and outward in opposite directions. Synclines alternate with anticlines, which have sharply arched folds from whose central axis sedimentary strata slope downward in opposite directions.

Prior to uplifting, new layers of inter-bedded silt and sand, deposited by Cretaceous rivers, subsequently covered many of these areas. Still later, dense tropical forests covered this region for an extended period. The accumulated debris from decaying organic matter was compressed by overburden and by the forces of tectonism to form coal seams. One such seam, No. 4 seam, has been mined in the Smoky River area using surface and underground mining methods.

This coal seam is of metallurgical grade coal averaging 6-m in thickness in the former SRCL mine site. Slag and tailings of this high-grade metallurgical coal have been used to supply power at the nearby ATCO power plant. The removal of overburden and coal by surface mining over the past two decades exposed the dinosaur tracks, making them potentially available for scientific research and tourism activities.

It has been less than 11,000 years since the glaciers retreated from the larger valleys that drain eastward from the Rocky Mountains. Glaciation was the principal landscape shaper of the last 1.5 million years during the Pleistocene Period. During this period, four principal glacial "advances" have been recorded in North America, each of different extent and duration.

Many earth scientists and archaeologists believe that the Foothills Region near Grande Cache may have been ice-free during the most-recent (Wisconsin) advance, potentially providing a corridor that could be used by plants, animals and humans to survive and travel. An ice-free corridor may have provided the only inland route by which native people occupied the interior plains as the great continental glaciers receded to the northeast. Such a corridor may have extended to a land bridge connecting North America to Asia by the Bering Sea. At that time, sea levels were lower than at present due in part to water stored in glaciers. Archaeological remains excavated west of Grande Prairie (Saskatoon Mountain) and near Banff indicate that native people occupied the Foothills Region and major Rocky Mountain valleys at least 10,500 years ago. These findings are amongst the oldest archaeological finds in western North America, and may reveal much about the possible existence of an ice-free corridor along the front ranges of the Rocky Mountains during a period of intensive glaciation.

Several interesting geological features are located close to Grande Cache. The most popular is the Sulphur Gates, located at the confluence of the Sulphur and Smoky Rivers. At this location, the rivers have carved an impressive canyon through less resistant layers of vertically bedded conglomerates of the Gates Formation.

3.1.3. Biophysical Resources:

Information about the biophysical resources of the region is summarized in several provincial publications and in Jasper author, Ben Gadd's *Handbook of the Canadian Rockies*. Provincial publications consulted include *Ecoregions of Alberta* by Strong and Leggat; *Natural Regions and Subregions of Alberta A Revised Classification for Protected Areas* by Achuff; and *Natural Regions, A Framework for Alberta's Special Places*. Complete references are cited at the end of this report.

The Grande Cache region lies within Alberta's Upper Foothills Subregion. The region is diverse in landscapes and appearance as it is transitional between the Boreal Forest, Rocky Mountain, and Foothills Natural Regions (ecoregions), but is below treeline and elevations associated with Rocky Mountains Alpine Subregion. This region is sharply differentiated from more southerly regions of the Foothills Natural region by a cooler climate and wetter summers. West of the Smoky River, the broad valleys of the foothills (characterized by grassy meadows, aspen stands, and lodgepole pine) slowly yield to higher subalpine valleys where lodgepole pine forests yield to white spruce and eventually to subalpine fir. Biodiversity is lower here than in the Lower Foothills Subregion because of climatically induced lower diversity in plant communities.

To the east, characteristics of the Wetland Mixedwood Subregion of the Boreal Forest Natural Region appear. Here, glacial lake sediments intermix with glacial tills and organic soils. Poorly drained areas have a cooler temperature regime. Forests are comprised of interspersed stands of aspen, balsam poplar, white spruce and birch. Poorly drained areas may be covered with a carpet of peat land, willow-sedges and black spruce. Pine and mixed conifer forests prefer better-drained upland regions, but at this latitude are cool enough to support a rich flora of arboreal and ground lichens – preferred habitat for woodland caribou.

3.1.4. Wildlife Resources

Sitting immediately north and east of Wilmore Wilderness Park (4,464 sq. km.) and at a distance of 403 km by road from Edmonton, the nearest major population centre, wildlife resources in this region are diverse and abundant. The Smoky River Coal Mine site is situated immediately adjacent to extensive areas zoned by Alberta for Prime Protection or as Critical Wildlife Habitat for bighorn sheep and woodland caribou. The region is home to 20% of Alberta's population of bighorn sheep, to mountain goat, and to the West Central Alberta woodland caribou herd with an estimated population of approximately 5,000 animals.

Bighorn sheep and backfill area. Photo courtesy of Jan Bloomfield

Woodland caribou are classified as an endangered species pursuant to the Alberta Wildlife Act. Caribou herds have declined dramatically in the last three decades, giving rise to special efforts to protect this species and its critical habitats. Threats to caribou populations include: industrial activity on critical habitat; uncontrolled access; loss of habitat to human activity; and disturbance of traditional travel routes. Caw Ridge, situated north of the 12-Mine site, has been rated as critical summer and winter caribou range. In winter, caribou occupy lichen-rich forests, including a broad zone crossing a 40 km stretch of Highway 40 south of Grande Cache. Although opportunities exist for enhancing interpretation programs and facilities in the region, tourism practices that would allow potential increased disturbance of wildlife should not be promoted.

Diverse landscapes and vegetation associations support rich biodiversity. Near Grande Cache, mountains, foothills, boreal forest and broad valleys converge to provide a setting for diverse habitats. Other large mammals that share habitat in this area include black and grizzly bears, mountain goat, elk, deer, moose and cougar. The area also features diverse small mammal and bird populations. The area's rivers support a variety of native fish species including bull trout, Arctic grayling, rainbow and brook trout.

Backcountry travel on foot and horseback, as well as hunting and fishing, are important to residents and visitors alike. These traditional activities provide economic gain for several outfitting and guiding businesses in the Grande Cache area.

3.2. RESOURCE MANAGEMENT AND PROTECTION ISSUES:

All dinosaur tracks considered in this study are located within the former SRCL mine site. Map 2 illustrates the boundaries of the former coal mining properties and the general location of the dinosaur track sites. The track sites with potential for tourism activity are all located north of Sheep Creek. The bridge crossing Sheep Creek is about 7.5 km from the intersection of the Smoky River haul road and Highway 40.

Subsequent to SRCL going into receivership, coal mining has ceased and all leases have been disclaimed back to the provincial Crown. The area will be subject to additional applications for dispositions and some former mining areas and roads will be reclaimed by Alberta Sustainable Resource Development. The applicable land use zoning is "Multiple Use". The northern edge of the site is identified as winter habitat for bighorn sheep and woodland caribou. Weyerhaeuser Canada Ltd. has a Forest Management Agreement Area adjacent to, and within the northeastern margins of, the former mine site.

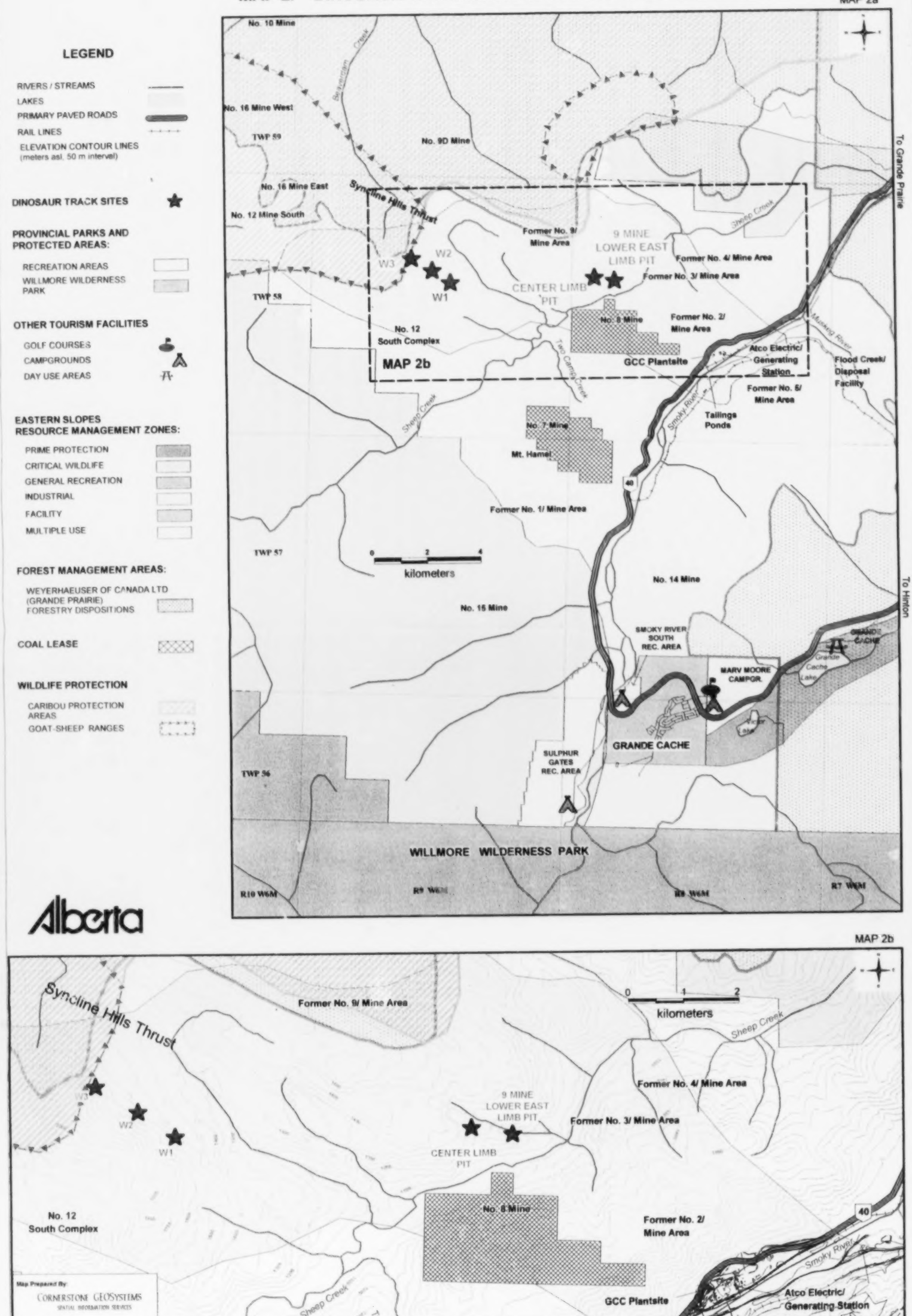
With the exception of the dinosaur track sites, no other special resource features have been identified within the perimeter of the former coal mine site (north and south of Sheep Creek), and no protected designation status has been assigned to resources in this area.

3.2.1 Protection of Palaeontological Resources

Palaeontological resources include dinosaur tracks as well as extensive plant fossils that are scattered throughout the mine area, and are common near dinosaur track sites. Tyrrell Museum officials responsible for resource protection echo the recommendations of museum and palaeontology experts from other sites that the dinosaur tracks, and the geological matrix within which they are found, be left undisturbed, and subject to natural forces of weather and erosion.

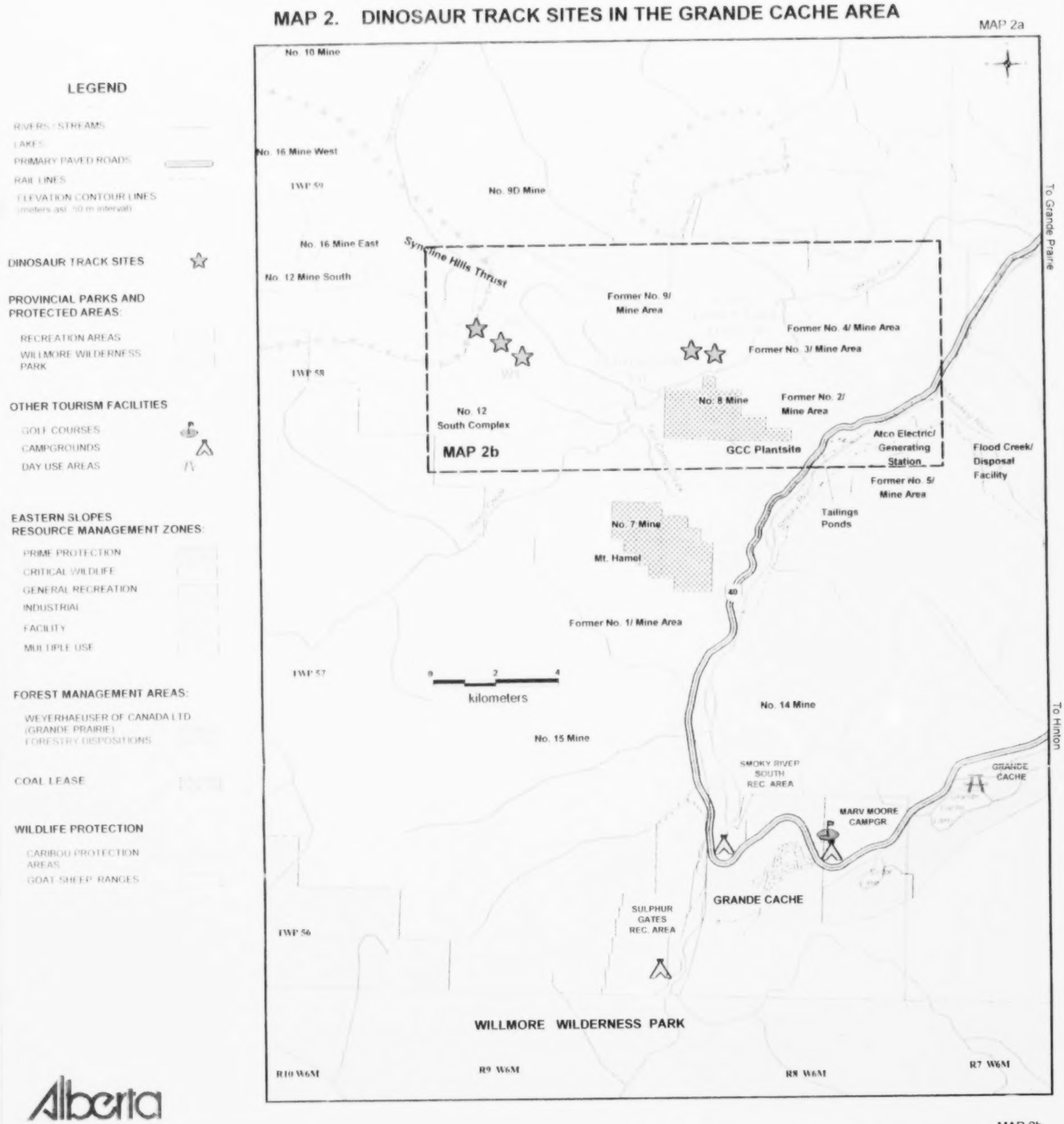
This course of action is unanimously preferred over interventionist practices such as further rock bolting, or chemical treatments to prevent water penetration. Such interventionist practices are seen as having greater potential to damage palaeontological resources than simple protection from human disturbance. Tyrrell Museum officials have recommended placing additional backfill at the base of some of the steeper slopes containing track sites as a less intrusive stabilization measure. These additional fills might also be used for the construction of viewing facilities for visitors.

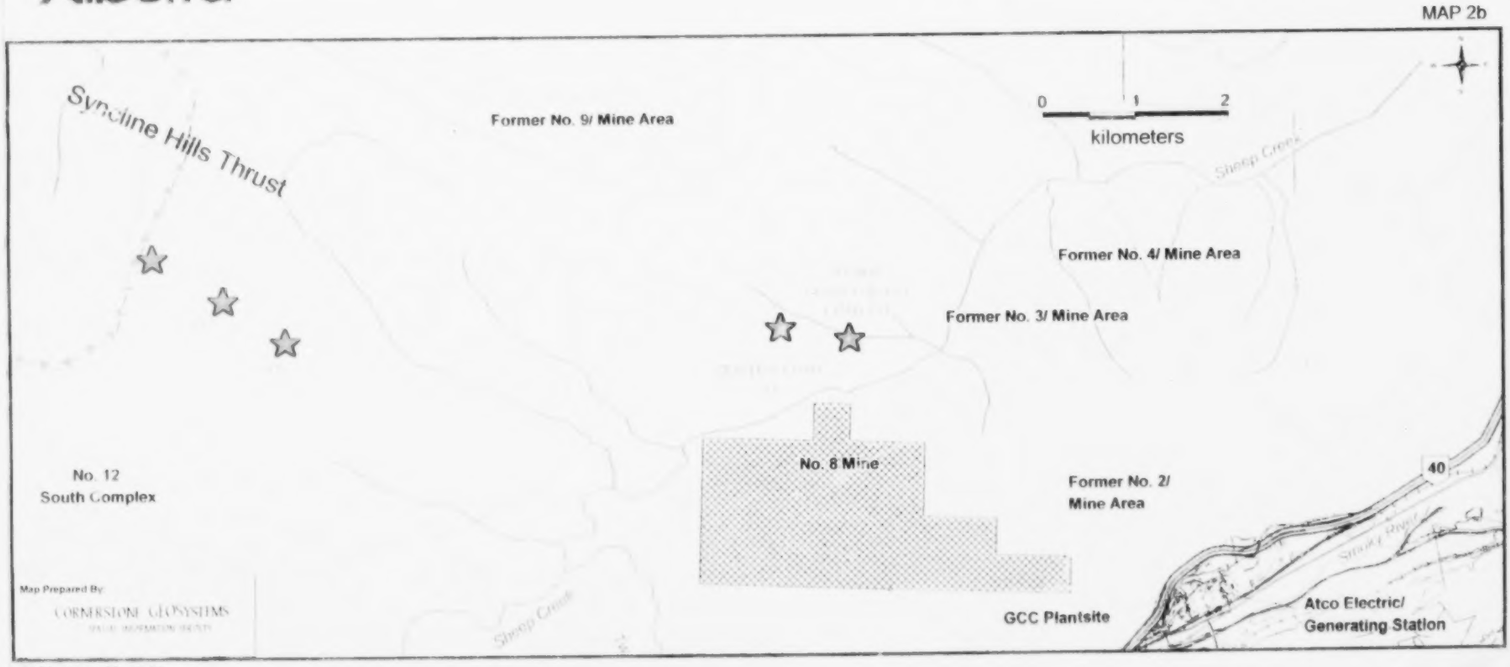
MAP 2. DINOSAUR TRACK SITES IN THE GRANDE CACHE AREA



Alberta

MAP 2. DINOSAUR TRACK SITES IN THE GRANDE CACHE AREA





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Over time, natural forces will destroy existing tracks. Tyrrell Museum staff note that some slopes may fail in a five to ten year time period while others may extend for several human generations provided human contact is restricted. As tracks slough off slopes or become less distinct, other tracks will emerge from beneath the successive layers of sandstones and mudstones that comprise the Gates Formation. The advice of a structural engineer may be warranted to determine the stability of slopes proposed for public access.

The Tyrrell Museum also supports recommendations to create latex casts of the more significant dinosaur tracks at the Smoky River sites. Such casts can be used to create replicas for scientific study and record, and for off-site exhibits and program props. Few large track replicas exist at present in museums and tourism displays in the region.

Alberta Community Development (Tyrrell Museum) is responsible for the protection and custody of all palaeontological resources in the province, including the dinosaur tracks sites near Grande Cache. Measures for site development for tourism and resource protection should be determined by, or in consultation with, Tyrrell Museum staff who have expressed their support for community initiatives to increase awareness of, and provide access to, these track sites.

Tyrrell Museum officials have confirmed Richard McCrea's assessment of the scientific importance of the Smoky River dinosaur track sites. While Museum officials support this tourism initiative, at the present time they do not have the necessary funds to extend protection measures, nor to undertake additional research. Such funding should be secured from other sources if tourism development of the track sites proceeds.

Although the wholesale destruction of palaeontological resources by human activity is a definite risk, natural processes will result in constant alteration of resources as they are sloughed off as a result of slope failures and frost-thaw cycles. The key to minimizing human disturbance to dinosaur tracks is to install fences that are gated and locked. Tourism activities may be useful to scientists by providing a form of site monitoring and documentation. Involving visitors in a comprehensive program to photograph and map all track sites may provide an interesting "field" experience managed by a sustained volunteer group. Such a program would benefit resource protection and potentially provide a vehicle for accessing funding resources for installing protective facilities, conducting research, and developing interpretive media and visitor facilities.

Restricting access (direct contact) to all significant track sites is required for both resource protection and public safety. Direct access may be possible to the W1 track site where a slab of "coaly" rock features so many *ankylosaur* footprints intermingling on the site that Richard McCrea has described this intermingling of tracks as forming a "dinoturbated" landscape.

3.2.2 Protection of Biophysical and Wildlife Resources

In addition to palaeontological resources, tourism activities should include plans to minimize potential impacts to wildlife, wildlife habitat and reclaimed areas. Restricted access to active mining areas has provided a measure of protection for biophysical resources and wildlife; however, public use is permitted and will likely increase when mining ends.

The track sites of principal tourism potential are on the southern edge of an area designated as winter habitat for bighorn sheep, mountain goats and woodland caribou. Active mine reclamation may create additional attractive winter habitat for sheep. Despite their inquisitive behaviour and ready habituation to human activity, winter remains a critical period for all ungulates, requiring that special measures be put in place to minimize disturbance. Winter visitor use is expected to be quite limited, reducing the potential for significant impacts. Bighorn sheep in this area have become habituated to human activity. During the course of active mining and reclamation, 'no-shooting' provisions protect mine workers and sheep.

Reclamation provides attractive forage and escape habitat; however, in the event that the roads in the former coal mine site became open to public access, these sheep would be easy prey to hunters and poachers. The regulatory provisions of Alberta hunting laws apply on all public lands and active resource development sites.

During certain periods of the year, woodland caribou cross Highway 40, moving through traditional winter habitat areas. Travelers to Grande Cache from both the south and the north need to be made aware of the potential for encountering caribou on or near the roadway, and of the response required to protect these animals whose status is rated as threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Weyerhaeuser Canada operates a timber-harvesting program adjacent to the former mine site, north of Sheep Creek. Visitors should be cautioned of the need to protect forest resources from the effects of fire. Risk of grass fire is increased in sites that have been reclaimed. To mitigate this risk, smoking should be banned or permitted only in controlled areas that are equipped with facilities for extinguishing cigarettes.

3.3. LAND TENURE, LAND USE, ACCESS, PUBLIC SAFETY AND SECURITY

Alberta's Eastern Slopes Policy places a high priority for resource development on lands zoned for Multiple Use in the northern Foothills region. The land area of the former SRCL mine site retains this land use designation, and while mining has ceased, there is interest in continued mining and other resource development activity in the area. The approvals process for future coal mine development activities may be lengthy, depending upon the nature of the development and the various provincial legislative requirements. It may include an environmental assessment review and public involvement.

If tourism activities are to be approved in this region, they must be able to 'compete', or 'co-exist', with other land uses to secure and hold both the required land base (in this case the dinosaur footprints and trackway sites) and access. In addition, while exclusive land use may be secured for small parcels, access for tourism activities will have to occur within a multiple land-use context. The existing haul roads in this area will be used to meet diverse resource industry needs, including oil and gas, forestry, mining and public access.

The acquisition of a disposition or other authority to use existing or new roads for access also carries with it considerable potential liability and exposure to secondary costs. Tourism lessees may be required to indemnify the Crown (and potentially other industrial lessees who have primary access authority), and therefore, carry appropriate liability insurance. In the absence of other road users, tourism lessees will also be responsible for providing road maintenance and for the cost of reclamation of areas subject to their use and benefit.

These risks are not 'deal-breakers' for access to the dinosaur track sites; however, they define the land use, risk, and financial context within which tourism access proposals must be considered.

3.3.1 Competing Land Uses

Proposals to access the track sites within the former SRCL mine lease for tourism, even on a limited scale, will be considered by the Province in association with existing land uses, surface dispositions, as well as other proposals that may be currently in the provincial application and/or review process. Resource land uses that are approved, or are undergoing active consideration, include:

- Weyerhaeuser Company Ltd. - Canada has a Forest Management Agreement Area (FMA) on lands situated immediately north of the former SRCL mine site. To gain access to its FMA, Weyerhaeuser also requires use of the main Smoky River haul road. Mine haul roads are used for both harvesting and hauling. Weyerhaeuser also constructs roads for its sole use, or for shared use. For all roads it constructs, Weyerhaeuser is responsible for all costs of construction, maintenance and reclamation. A major portion of Weyerhaeuser's use of roads in the former SRCL mine site occurs during the winter months, although the company is looking to secure approvals to undertake summer forest work;

- D & R Resources Inc. has received temporary authority to use the existing haul roads to move stockpiled coal from the 12-mine site to the ATCO power plant located at Highway 40. D & R Resources officials report that this haul project will end in March 2001. D & R Resources also plans to apply to the AEUB (Alberta Energy Utility Board) to re-open a portion of the 2-Mine site near the existing plant location, and is potentially interested in further coal exploration and extraction above the 12-Mine. Environment Protection and Enhancement Act, Water Act, and Public Lands Act approvals will be required for surface rights to re-open 2-Mine. Coal hauled from 2-Mine will be transported to processing facilities and the ATCO power plant via the existing conveyor under Highway 40;

- GCC (Grande Cache Coal Company Inc.) has acquired mineral (coal) leases at the 7-Mine underground area (Mt. Hamel) and the 8-Mine surface area from Alberta Energy. Coal would be hauled from these mines to the processing plant via a portion of the main Smoky River haul road, and via the re-constructed trans-mountain conveyor (subject to agreements between GCC and D & R Resources for access to the east portal and to ensure that the conveyor route is not undermined). A portion of the main haul road remains within a lease that has been transferred to GCC; however, at this time GCC holds no surface leases or other instruments giving them surface access to the area on a permanent basis. GCC is undertaking environmental and other required studies to support applications. Alberta Sustainable Resource Development may issue surface leases or Licenses of Occupation in the future, entitling GCC to use portions of the existing haul roads. GCC has also indicated an interest in other coal resources in the former SRCL mine site, including at 16-Mine, an extension of the 12-Mine anticline. GCC has also purchased the equipment at the former SRCL preparation plant adjacent to the ATCO power plant, although the plant buildings themselves remain the property of the Provincial government;

- Oil and Gas companies may submit applications for exploration (and subsequently development and pipelines) for sites within and adjacent to the former mine site. In addition, some use of existing haul roads and cancelled leases may be required for exploration staging on adjacent lands presently subject to access limitations. Canadian Forest Oil Ltd. uses the Smoky River and 12-Mine haul roads to stage exploration on adjacent land in Township 59. During initial stages of exploration and development, heavy equipment may be frequently used. During operational phases, lighter vehicles would primarily be used on access roads.

Finally, public access may be allowed in the future. When lands are no longer held under lease and reclamation is completed, public rights of access and use may become re-established. Recreational activities, both active and passive, are possible, although access to former mine workings may be discouraged or limited when risk management processes identify safety concerns. The province currently uses gates and signs to discourage vehicular access.

3.3.2 Land Tenure for Tourism Activities

The Province uses a system of land tenure (leasing, licensing, etc.) for reviewing land use and resource development applications and for granting mineral, surface and access dispositions. At the former SRCL mine site, land is managed through a disposition process administered by Alberta Sustainable Resource Development. To govern the establishment and operation of coal mines, the Alberta Energy Utilities Board (AEUB), Alberta Sustainable Resource Development, and Alberta Environment act together as regulators. The AEUB issues mining permits and licenses; Alberta Sustainable Resource Development issues surface dispositions under the Public Lands Act; and Alberta Environment provides resource development controls through approvals under the Environment Protection and Enhancement Act and the Water Act. Mineral Leases (issued by Alberta Energy) are required for all coal mining operations, and mine boundaries are established within these leases.

To evaluate tourism opportunities, two principal issues arise from competing land uses:

1. Can tourism be compatible or co-exist with other industrial land uses? If so, what is the most appropriate and affordable method to secure approvals and to protect the resource?
2. What methods can be used to provide reliable, economical, and safe access to tourism attractions?

The mechanism established by the Province to secure long-term leases for tourism proposals is the Alberta Tourism Recreational Leasing (ATRL) process. This process provides for appropriate public review and allows tourism activities and permanent developments to occur on provincial Crown land. A project approved through the ATRL process would likely be issued a 'Miscellaneous Lease', providing for exclusive use.

A Miscellaneous Lease is the preferred land tenure instrument for permanent tourism developments. Other temporary forms of authority may also be issued, although usually for a shorter period of time, and without the exclusive land use right conveyed in a Miscellaneous Lease. Licenses of Occupation are required for permanent access roads. Both Miscellaneous Leases and Licenses of Occupation include liability for the cost of reclamation.

Although long-term, secure access may itself be difficult to obtain for the dinosaur track sites, tourism activity may require that the lessee or operator invest in safety installations and support facilities, such as lighting, toilets and interpretive media, to improve or enhance the quality of the tourism experience.

To ensure that the dinosaur track sites are most effectively protected and managed for tourism activities, it is recommended that the municipality of Grande Cache, or a non-profit group, such as a 'Friends' association, pursue a lease through the ATRL process. There are many advantages to having a non-profit group lease and manage access to the dinosaur track sites. These include the opportunity to secure government and industry funding and grants, the ability to attract a volunteer cadre, and the assurance of government that the resource will be protected without reference to operational profitability.

For the dinosaur tracks sites exposed during the operation of the former SRCL mine, it would appear to be possible to establish tourism leases at key sites within both the 12-Mine and 9-Mine sites to meet the following diverse objectives:

- Restrict tourism developments to sites that have been previously mined;
- Define a lease area that is large enough to provide sufficient land to protect the footprints and trackways from unauthorized access (fencing);
- Provide sufficient space onsite for off-road parking; erection of safe viewing platforms, lights and other facilities; and provision of facilities such as interpretive media and toilets;
- Provide a secure site for scientific research;
- Provide sufficient space for undertaking safety procedures, such as rock scaling; and
- Provide suitable measures to protect the tracks and track sites from destruction.

By limiting tourism leases to the minimum land area required to effectively sustain the resource and the activity, direct conflicts with other industrial users would be minimized, as would the perceived threat of 'sterilizing' resources from alternate uses, some of which may be perceived to offer higher social or economic return. Limiting the scale of such leases also reduces potential end-of-the-day site reclamation costs for the disposition holder.

Until long-term resource development and access requirements have been determined through formal application processes (a two to three year period is envisaged), it is unlikely that Alberta Sustainable Resource Development will recommend approval of any significant ATRL applications for the dinosaur track sites within the former SRCL mine site. Consideration of applications under the ATRL process would depend on their scale and complexity. In the interim, Alberta Community Development (Cultural Facilities and Historical Resources Division) should place a protective notation on the track sites, and access for tourism activities should be by short-term authority only (refer to Sections 3.3.3.). While such a delay may be a deterrent to short-term tourism investment, it may provide a cost-effective means for securing access on a longer-term basis.

The specific risks associated with competing land uses have been described and assessed in the foregoing; however, extractive uses have traditionally occurred on lands from which other land uses have been excluded. To ensure that support for limited tourism developments will be secured from other resource users in the region, effective programs of communication and collaboration will be essential. Without them, unnecessary resistance might be expected from other resource users, and application for protected status for dinosaur track sites may be opposed by agencies, companies and individuals who are concerned that the opportunity for future resource extraction would be impacted by such designation or use.

3.3.3. Historical Resources Designation

Alberta Community Development has confirmed that the dinosaur track sites and associated fossil evidence have basic protection under existing legislation through the Historical Resources Act of Alberta. McCrea (2001) confirms that the Grande Cache track sites have provincial, national, and international significance. With the support of the Tyrrell Museum, he has recommended that, in addition to securing a land tenure agreement for tourism use, the dinosaur footprints and trackways be designated as a "Provincial Historic Resource" (PHR) under Alberta's Historical Resources Act for scientific as well as tourism purposes.

A process of study and evaluation of the dinosaur track sites at the former SRCL mine site has been initiated by Alberta Community Development (Cultural Facilities and Historical Resources Division) to determine whether designation for protection and beneficial use is warranted. Such designation need not be fettered by adjacent industrial land uses, provided that such land uses do not threaten the existence or condition of the designated resources. Tourism access to, and enjoyment of, Alberta's historical resources is appropriate, subject to the proviso that such activities do not place the palaeontological resources at risk.

If additional protection is deemed necessary, Alberta Community Development will first establish a "protective notation" for the land and register such a notation with the land manager, Alberta Sustainable Resource Development. Protective notation provides short-term protection by flagging the resource during any land disposition process. Immediate action to secure protective notation is an essential first step to ensure that the track sites are protected.

For historic resources to have increased protection on a sustained basis, they and the land on which they area situated, may be assigned "Provincial Historic Resource" (PHR) status. Signage and boundary marking would be desirable. To ensure that such designation would not unnecessarily sterilize resources that may have considerable future economic value, or interfere with access to other adjacent economic resources, PHR designation should be limited to the footwall and adjacent areas required to provide assured protection.

In the event that PHR designation is secured for the key dinosaur footprints and trackway sites, they would likely remain under the administration and control of Alberta Sustainable Resource Development, although Recreation or Miscellaneous Leases may be issued for the designated lands subject to the approval of Alberta Community Development. This would permit the designated land to be developed for tourism facilities and activities, subject to requirements to protect designated resources. With PHR status, up to $75,000 in funding may be available through the Heritage Preservation Partnership Program (Alberta Historical Resources Foundation) to support resource protection, research and interpretive media development.

3.3.4. Access to Dinosaur Track Sites

Access to the dinosaur track sites is by the Smoky River, 12-Mine and 9-Mine haul roads, all of which were built to a standard sufficient for use by haul trucks weighing up to 150 tons total weight. Until the AEUB has approved any new development and other approvals have been issued under the Environmental Enhancement and Protection Act, the Water Act, and the Public Lands Act, roads to the existing mine sites will be gated and locked, providing a suitable measure of security for the area's resources and ensuring public safety.

In the event that no further approvals are awarded, the former mine haul roads will be reclaimed and/or may remain open for public access. At present, the Smoky River haul road is not gated at Highway 40, and is open to public access at the individuals' own risk. Roads to 12-Mine and 9-Mine are gated and locked.

In the short term (3 to 5 years), Alberta Sustainable Resource Development, Alberta Environment, and the AEUB will be active in the area with respect to abandonment and reclamation of the former SRCL mine site. One of the major uses for the existing haul roads that can be anticipated in the future relates to efforts to reclaim all or part of the old mine areas. Some reclamation activities could occur as early as the summer of 2001. Even if mining is renewed, public safety concerns that flow from mining activity may make it necessary for sustained tourism use to be delayed pending satisfactory resolution of outstanding safety issues related to haul truck traffic, run outs, pull offs, dust, etc.

A second potential access route into the former SRCL mine site is via the 'Beaverdam' Road. This unimproved access has no disposition attached to it, but is used extensively by the public despite periodic flooding and interruption, and a lack of maintenance. This road intersects the Smoky River haul road north of the Sheep Creek Bridge, providing an alternate means of access to the dinosaur sites that would have less direct interaction with resource lessees. However, without considerable additional investment to construct an improved roadway, and a commitment to maintenance by a third party such as the local Municipal authority, this route warrants limited consideration for tourism access at this time. Local Municipal authorities may be reluctant to assume road maintenance costs to support tourism.

On provincially controlled Crown land, authority to build or use existing roads to provide access to leases carries with it responsibility for the cost of road maintenance and final reclamation.

For lessees or tourism operators whose operations are non-profit or of small economic scale (such as a tourism operator providing a limited program of visits to the dinosaur track sites), assumption of financial responsibility for road development, maintenance or reclamation may not be feasible, notwithstanding the fact that such responsibility may be limited to the scope of the improvements and operations directly ascribed to tourism activities. The tourism lessee or operator may, however, enter into a 'Road Use Agreement' with the holder of an existing disposition (surface lease) to provide access for defined consideration. Provided the tourism lessee or operator has the approval of the province for its activities, Road Use Agreements may be established without further government approval. Alberta Sustainable Resource Development will get involved, if necessary, to facilitate Road Use Agreements between surface disposition holders.

Such consent was used in the past to provide limited access to the dinosaur track sites and for tours centred on fall colours, and is the basis for tourist activity and access to the Rat's Nest Cave System within the confines of the Continental Lime lease near Canmore. Provided an industrial user has assumed primary responsibility for an access road, a Road Use Agreement may be the least expensive means of securing tourism access.

Alberta Sustainable Resource Development, Alberta Environment and the AEUB will require use of the Smoky River, 12-Mine, 9-Mine, and other haul roads for several years if future coal mining activities proceed north and west of Sheep Creek, and until reclamation efforts are concluded. As noted in the previous section of this report, Weyerhaeuser will require use of the Smoky River haul road on a sustainable basis for winter log hauling, and access may be required for oil and gas exploration and development.

In the absence of a major lessee (such as a coal mining company) that has already assumed such cost responsibilities, and provided exclusive use is not required, tourism lessees or operators may apply to Alberta Sustainable Resource Development for short-term authorization to use the haul roads. Short-term authority to use the haul roads within the former SRCL mine site could be provided in the form of a Temporary Field Authorization (TFA) or letter of authority. TFA's are issued by Alberta Sustainable Resource Development to provide interim or short-term (one year maximum) authority to use roads that may not be open to public use. Prior to issuing TFA's, it is the policy of Alberta Sustainable Resource Development to contact other stakeholders. TFA's do not provide exclusive road use, and they are generally not issued where long-term or continued access is required. TFA's do not relieve the operator from liability and maintenance costs.

It is unlikely that a tourism lessee or operator will have the resources to single-handedly accept the financial responsibilities associated with long-term security of access. Investments in improvements made at the dinosaur tracks sites should reflect the reality that access may be short to mid-term and may occasionally be interrupted. When all mining and resource use has ended in this area, it is possible that some of the access roads may be designated for public use, and some may be turned over to administration and control by the local Municipal authority. At that time, the tourism authority holding the lease to the dinosaur track sites may be able to negotiate a longer-term access agreement.

The mine roads that would be used for access to the dinosaur track sites are generally wide enough to safely accommodate two lanes of traffic, with the bridge crossing Sheep Creek being the narrowest point between the mine entrance and the dinosaur track sites. Although this bridge is wide enough to accommodate haul trucks for coal or logs, the width of these vehicles would require that it be operated as a single-lane crossing. The bridge is approximately 7.5 km from the access road entrance from Highway 40.

The dinosaur sites of highest potential for tourism activities (12-Mine and 9-Mine) are located alongside existing haul roads between 3 and 5 km beyond the Sheep Creek Bridge. The portions of the access roads between the bridge and these sites are steeper. Road width narrows near switchbacks and sharp bends, particularly on steeper slopes. At the dinosaur track sites themselves pullouts will be required to provide a safe access to visitor areas that do not interfere with haul road use. Pullouts and stopping areas for tourist vehicles must not block access to safety run-offs for haul trucks.

In the proper type of vehicle (climbing gears, large-wheel, heavy-duty suspension, multi-wheel drive), and subject to appropriate driver training and safety conditions, the mine roads provide virtually direct access to the dinosaur track sites. The haul roads and associated emergency lane run-outs (designed for haul trucks) provide ready access to all track sites, some to within 50 meters. These access routes provide excellent sites for viewing and photography, and access for the construction of outdoor or covered interpretive media. Note that emergency run-outs cannot be used for tourism access in the event that active mining resumes on the 12-Mine or 9-Mine haul roads. As noted in Section 3.5, visitors will not be able to directly approach most of the track sites unless sufficient precautions are taken to minimize risk of injury from falling rocks.

Some dinosaur footprints, such as those at lower elevations on W1, can be directly viewed from pullouts (which will have to be constructed) on haul roads. Others, including footprints and trackways at W2 and W3, are situated on steep (60°+), anticlinal slopes where risk of debris fall is high and effective rock scaling would not be economically feasible. These sites are located between 75 and 150 meters from the access road. In many cases, the intervening space has been filled to stabilize the exposed rock wall, and this fill reclaimed. Engineering studies should be undertaken prior to the development of visitor facilities at these sites.

Roadway design and maintenance standards are geared to the needs of haul trucks. The surface can be graded, but would be rough to vehicles with smaller tires and lighter suspension systems. Ditches and lateral drainage are not built to highway standards (heavy loads make shallow culverts non-feasible), with the result that surface water drains across the road, with risk of ice build-up during the winter months unless heavy-duty maintenance is carried out on a regular basis.

Roads within the mine perimeter are muddy and slick when wet, and have a cast of coal dust making special overshoes advisable for visitors throughout the year. During periods when the road surface is wet, steeper slopes can be slick, requiring use of chains for all classes of vehicles, and often requiring vehicles equipped with 4-wheel drive. For this same reason, special care would have to be made to ensure regular cleaning of all facilities used in any tourism program, including vehicle and equipment washing, and daily cleaning of signs and interpretive exhibits.

Officials of all resource companies contacted by this research team expressed their conditional support for potential tourism access to the dinosaur track sites. Their concerns relate principally: to the conditions required to ensure public safety (e.g., traffic, dust, training, communications), to provide an enjoyable tourism experience, and to minimize any interruption of their operations. For example, further development of mining at the 12 and 16 Mine sites may result in the daily transport of as much as 6,000 tons of coal on the 12-Mine haul road in front of several significant dinosaur track sites. Based on a 12-hour day, this would place 150-ton haul trucks on the road at 15 to 20 minute intervals in each direction, potentially jeopardizing tourism use or enjoyment of these sites. Resource companies also expressed their support for expanding tourism themes at the former SRCL site to include coal mining and reclamation, and confirmed that information and education are interests they share with local tourism agencies and operators.

Alberta Transportation (Peace River Operations) confirms that the intersection of Highway 40 and the main Smoky River haul road (adjacent to the ATCO Power Plant) is not of a high enough design standard to permit its safe use by commercial passenger buses or vans. Sight lines at the intersection are quite limited, as this intersection sits on a slight rise with a sharp curve to the south. While coal haul trucks have remained technically 'off-road', using only the haul roads and a private road overpass to the coal processing plant, log trucks, oil and gas exploration vehicles, and tourist traffic would be obliged to use the existing Highway 40 intersection. Alberta Transportation has notified Weyerhaeuser and other haul road users that access to the haul road (or to Highway 40) to and from this intersection will no longer be permitted for commercial traffic. This prohibition will also apply to tourist operators' vehicles.

Construction of a new, safer intersection is the long-term solution. Plans are being developed by Weyerhaeuser to construct a new haul road intersection and access link to the Smoky River haul road from a point 2 km north of the existing intersection. Construction is planned for the fall of 2001, allowing Weyerhaeuser to continue forest operations this winter. Alberta Transportation confirmed that the new intersection would be suitable for all forms of tourist traffic, including highway coaches, subject to securing a consent agreement from Weyerhaeuser.

As an interim measure, for the summer of 2001, although tourism traffic is expected to be infrequent (commercial buses only), the authors recommend that access to the Smoky River haul road be secured by using the Highway 40 overpass access within the former SRCL plant site, to the ATCO Power Plant site. Such an arrangement would be permissible to Alberta Transportation, provided the design length of commercial tourist vehicles was restricted to ensure visitor safety at all intersections. Vans and buses of 20-passenger design (similar to the staff buses formerly operated by SRCL) would be acceptable to Alberta Transportation.

Within the ATCO Power site, access to the mine haul road for the summer of 2001 would involve approval to use road segments under the authority of the Province and ATCO Power. The overpass is under the authority of Alberta Transportation, as is a one Km segment of road that bypasses the main ATCO operation site. A portion of the access road to the overpass runs through the leasehold of the coal processing plant, which is presently under Provincial authority.

ATCO Power staff in Grande Cache have expressed their support, in-principle, for the dinosaur track site tourism proposal based on the benefits it would offer for local economic diversification as well as to demonstrate their support for community-based initiatives. A principal concern for ATCO Power will be ensuring that tourism operators carry sufficient liability insurance and effectively indemnify ATCO Power for their use of ATCO Power facilities. For ATCO Power to consider a specific tourism access proposal, a letter of application should be submitted to them. The application should demonstrate that approval from affected provincial agencies has been secured.

3.3.5. Liability and Public Safety Issues

Liability concerns relate to hazards associated with the nature of the site; risks associated with the nature of tourism activities; and potential interactions with other land users.

Specific risks include: hazards as a result of land conditions from former mine operations; use of access and haul roads by other industrial users including oil and gas exploration, mining and lumber companies; and prospects that part or all of the mine may be re-opened. Inherent existing risks include: condition of roadways; risk of falling rock and landslides at the track sites and on haul roads; steepness and stability of slopes; subsidence of infill material or mass wasting on reclaimed sites; and reclamation and abandonment activity itself.

Concern for liability may be expected from the Province, from tourism operators' insurers, and from other industrial land users (Weyerhaeuser, Grande Cache Coal Co., D & R Resources). In the past, major lessees have been willing to grant occasional 'consent' for access to tourism operators wishing to visit the mine site; however, frequent use may bring with it increased concern for liability.

Alberta Sustainable Resource Development currently requires that holders of dispositions and other permits have a minimum standard liability insurance of $2 million, with higher levels possible where circumstances warrant. It is anticipated that a tourism operator will be required to maintain at least $2 million in liability insurance and possibly significantly more, particularly if tour buses are being operated at the site. Liability insurance and indemnity requirements of two to six million dollars are required for commercial lessees and tourist attraction operators whose business is located in Canada's national parks.

To meet the goals of its risk management program, the Province of Alberta requires that all activities on Crown land be regulated and administered under formal processes.

Land required for a tourism development would likely be under a Miscellaneous Lease (through the ATRL process), and access under a License of Occupation (LOC). This will reduce, but not eliminate, the province's exposure to liability claims. Liability requirements for roads will need to be addressed as road use agreements are established, by securing consent from an existing lessee, or an authority or disposition directly from the province.

With the exception of the hazards associated with road access to the dinosaur track sites, falling rock and debris slides pose a very real danger that must be mitigated through effective facility and program design. Mining may include blasting in areas adjacent to roadways, requiring closures and access interruptions. Richard McCrea has described rock falls at the dinosaur track sites themselves. Rocks falling and careening from above the track sites such as on the steep slopes at track site W3 may land as far as 50 meters from the rock faces themselves, posing a significant safety risk unless visitor access can be rigorously controlled. At certain sites, it may be feasible to undertake an active program of rock scaling (the physical removal of overhanging rock and debris) to minimize risk; however, any such program may pose a threat to the stability of the underlying dinosaur tracks resources.

A preferred alternative would be the installation of elevated steel stairways at key tourism sites, providing safe viewing towers or walkways. Such facilities may be built without any contact with the adjacent rock faces. At all dinosaur track sites, signage and fencing will be required for both public safety and to provide an additional measure of resource protection.

3.3.6. Mine Site Security

Any program of limited access for tourism (guided, interpretive) must be conducted in accordance with an operating protocol that minimizes risk to visitors, while also protecting the integrity of mine security measures. The mining company will determine opportunities for access to, or views of, operating mine facilities in consultation with provincial officials and tourism associations and operators. Tourism communications and promotions, published literature, and programs must be carefully designed to convey accurate information to ensure that visitors' expectations are appropriate to the experience.

Roads to mine pits that have not been reclaimed should continue to be gated and locked, restricting access to authorized vehicles. If mining recommences and haul trucks use the Smoky River haul road, gates should be installed at the Highway 40 access, as well as at the bridge at Sheep Creek to control access to the bridge crossing. Gates and locks would have to be designed and installed to facilitate access by authorized resource and tourism users.

3.4. INTERPRETATION AND EDUCATION

Several information and education themes can be identified and developed within the former SRCL mine area. While the dinosaur tracks provide a principal attraction, important secondary themes include Cretaceous geology; Columbian and Laramide orogeny (mountain building); coal mining, including human activities and the types of equipment associated with surface mining; mine reclamation; and wildlife appreciation (bighorn sheep and caribou).

The surface expression of the mine area is comprised of a series of alternating anticlines and synclines, the latter forming valleys between anticlinal ridges (see definition in Section 3.1.2). The #4 coal seam has been exposed and removed on the slopes of these anticlines, often at high elevation. The W3 track site at 12-Mine provides an extraordinary panorama of several such surface mine sites, one of the few such sites that can be viewed from "within" an active mine. Such good examples of geological features provide an exceptional opportunity to explain geological processes and palaeontological history.

The seasonality of tourism demand, periods of inclement weather, and road conditions will make site visits more challenging at certain periods, and virtually impossible during winter months. To complement site visits, off-site static displays will be required. Onsite, the 12-Mine and 9-Mine dinosaur track sites offer several potential locations for panoramas, onsite exhibits, and small shelters. Onsite programming need not be restricted to daylight hours. Indeed, lighting is the key to the quality of the dinosaur track experience, and installing lighting to enhance daytime viewing and to permit nighttime visits may be a considerable and unique additional attraction. Onsite educational visits should be of at least two hours duration within the mine confines. From Grande Cache, site visits may be of half-day duration.

There are no public services available within the mine site. Tourism services at the dinosaur track sites should include portable or pump-out toilet facilities. Meals and snacks should be provided, and all garbage should be hauled out to minimize risk of wildlife access to human waste.

4. TOURISM OVERVIEW

4.1. HIGHLIGHTS OF VISITOR INFORMATION FROM OTHER RELATED SITES

Recognizing that there are not currently large volumes of tourists visiting the Grande Cache area, and that there are no directly related palaeontological attractions or facilities in the immediate area on which to assess the potential number or profile of visitors, it is necessary to consider visitation levels in other similar sites and circumstances.

This broader assessment included a review of visitation and use at several of the Provincial Historic Sites or Cultural Attractions in Alberta, including the results of the "*Heritage Facilities Visitor Survey, Full Year 2000*", completed for Alberta Community Development. Information was also obtained regarding visitor use at other related sites across western North America as part of a survey of best practices.

In addition, visitor statistics from several Visitor Information Centres located throughout Alberta and in British Columbia were reviewed to assist in developing a profile of potential visitors to the area. Information from studies completed by the Alaska Division of Tourism and the U.S. Department of Transportation was also reviewed to help determine the profile of potential travelers along the Big Horn Highway on their way to or from Alaska.

4.1.1. Alberta Provincial Historic Sites and Cultural Attractions

Eight of the eighteen provincially operated cultural or historic sites in Alberta were identified for consideration in this assessment, based on their location or similarity of resources. Sites include: Frank Slide Visitor Centre, Ft. McMurray Oil Sands Discovery Centre, Head-Smashed-In Buffalo Jump, Leitch Collieries, Reynolds-Alberta Museum, Provincial Museum, Royal Tyrrell Museum of Palaeontology, and Tyrrell Museum Field Station at Dinosaur Provincial Park. Tables C-4 to C-7 regarding Provincial Historic Sites are included in Appendix C.

- Attendance at these sites continues to grow. In 1997/98, attendance was 970,973. In 1999/2000, attendance had grown to 1,027,939, a 5.9% increase.
- With the exception of the Provincial Museum in Edmonton (39.3%), the majority of sites receive their visitation in the summer (56.5% to 100%).
- With the exception of the Tyrrell Museum Field Station in Dinosaur Provincial Park, where most of the visitors are from "Other Canada" (55.2%), visitors to the remaining sites are predominantly from Alberta (39.3% to 83.3%).
- The average party size of visitors is about 3.6.

- The main purpose for the trip to the site is:
  - As part of a long trip (Frank Slide, Head-Smashed-In Buffalo Jump, Leitch Collieries, Tyrrell Field Station).
  - To visit the facility/see an event (Reynolds-Alberta Museum, Royal Tyrrell Museum).
  - To visit friends (Ft. McMurray Oil Sands Discovery Centre, Provincial Museum).
- Main influencers for visitor to Historic Sites include:
  - Friends/relatives at the Oil Sands Discovery Centre, Head-Smashed-In Buffalo Jump, and the Tyrrell Field Station.
  - Personal experience at Frank Slide, Reynolds-Alberta Museum, the Provincial Museum, and the Royal Tyrrell Museum of Palaeontology.
  - Road signs for the Leitch Collieries.

4.1.2. Information from Other Sites or Facilities

Information obtained from surveys of other facilities show a wide variation in numbers of visitors. The facilities most similar to the Grande Cache situation are those that are located in a fairly remote area, that have a requirement for visitors to pay to participate in a guided tour to see the resource, and that have a limited number of spots on the tours.

As a result of this review, sites like the Yoho Burgess Shale (1275 visitors in 2000), the Devil's Coulee Dinosaur Heritage Museum and Tours (1654 in 2000), the T-Rex Discovery Centre (7000 visitors in 2000), Copper Ridge Dinosaur Tracks (6,044 visitors in 2000), the Dinosaur Depot Museum (15,608 visitors in 2000), and Red Gulch Dinosaur Track sites (20,000 visitors in 2000), offer an indication of the numbers of visitors that might be expected as the Grande Cache Dinosaur Tracks attraction develops.

Access is limited to one small group per day on guided hiking tours at the Burgess Shales in Yoho National Park in British Columbia, with some interpretation offsite. Devil's Coulee in Southern Alberta has a small museum and a tour to see where the dinosaur eggs were found. The T-Rex Discovery Centre in Eastend Saskatchewan provides guided van tours to an area close to where the original T-Rex was excavated; however, the fossil remains are now on display in a new facility offsite, reducing the number of visitors taking the van tour. Copper Ridge in Utah, operated by the federal government, has self-guided trails and some free tours to view the tracks. The Dinosaur Depot Museum in Colorado is a combination of a museum in town and several sites at which there are a combination of guided and self-guided tours available. Red Gulch is a track site in a remote area of Wyoming that has limited development and provides both guided and self-guided tours, but only asks for donations.

If regularly scheduled tours are developed at Grande Cache, it should be noted that it is unlikely they will operate at full capacity in the first year or two of operation. The Burgess Shales noted it took a couple of years of operating at around 40% capacity before the product became well enough known to attract larger numbers.

TABLE 9: ATTENDANCE FIGURES AT PALAEONTOLOGICAL SITES

SITE	VISITATION		VISITOR DEMOGRAPHICS/ GROUP TYPE
	1999	2000	
Utah Field House of Natural History, Vernal, UT	79,752	70,435	N/A
Steinaker Red Fleet State Parks, Vernal, UT	Av 2,000	Av 2,000	N/A
Dan O'Laurie Museum, Moab, UT	7,485	8,527	N/A
Eccles Dinosaur Museum, Ogden, UT	132,000	134,095	Adults 33%, Seniors 3%, Youth 25%, School groups 19%, Other 19%
Museum of the San Rafael, Castle Dale, UT	10,000	8,000	School groups & seniors
Mill Canyon Fossil Trail & Copper Ridge Dinosaur Tracks, Grand County, UT	6,120 4,388	6,132 6,044	Average party size 4;
Dinosaur National Monument, Jensen, UT	250,000	250,000	N/A
Dinosaur Ridge VIC, Morrison, CO	40,000	60,000	1/3 school classes, 1/3 out of state, 1/3 local. Pre-school to post doctoral
Dinosaur Depot, Canon City, CO	15,873	15,608	Most school groups. Some information on origin from guest book.
Dry Mesa Dinosaur Quarry, Delta, CO	39	128	95% Caucasian, 2% African American, 2% Asian, 1% Hispanic; 54% adult/46% children; 85% from within 100 mi; average party size is 7 people; 90% family/10% school tour
Wyoming Dinosaur Centre, Thermopolis, WY	40,000	30,000	N/A
Red Gulch Dinosaur Track site, Central Big Horn County, WY	20,000	18,000	N/A
Yoho-Burgess Shale Foundation, Field, BC	1,147	1,275	N/A
T-Rex Discovery Centre, Eastend, SK	4,500	7,000	All ages, from preschool to old age
Calgary Zoo, Calgary, AB	400,000	450,000	N/A
Devils Coulee, Warner, AB	Museum -1,469 Museum & Site – 242 Groups – 243	Museum -1,654 Both – 653 Groups – 622	25 school groups in 2000
Dinosaur Provincial Park, Patricia, AB	83,000	85,000	N/A
Royal Tyrrell Museum of Palaeontology, Drumheller, AB	383,348	391,125	49.6% from Alberta, 35.4% from Other Canada, 6.1% from USA, 8.9% from Other International; average party size 4.32

Source: Best Practices Survey, February 2001

4.1.3. Visitor Information Centres

- Visitor Information Centres (VIC) are located throughout the province and operated by local community groups or the Alberta Government. Many visitors stop at these VICs for various reasons, including getting directions, finding accommodation, learning about attractions, finding out places they should visit in Alberta, and so on. They provide a venue for operations, such as tours of the dinosaur tracks in Grande Cache, to post information about the product for travelers through the area.

- Five Alberta Government VICs seem the most well positioned to influence travel to Grande Cache and the Dinosaur Tracks, including Hinton, Milk River, Lloydminster, West Glacier, and Field. VICs operated by the communities of Grande Cache, Grande Prairie, and Jasper, as well as one in Dawson Creek, British Columbia, were also considered.

- Each of these VICs is either close enough to Grande Cache to influence an excursion to see the Dinosaur Tracks, or they are on major highways leading into the province and close to other significant resources that might be identified by visitors as being of interest and that could affect trip planning.

- All of the VICs are generally experiencing an increase in the number of people stopping for information. The following Table 10 outlines the trends in visitor numbers and origins for the selected Information Centres. This information helps to determine the places of origin of possible visitors to the Grande Cache area.

- It is interesting to note the variations at VICs near Grande Cache. Hinton shows a predominance of visitors from Alberta (44%), with visitors from other parts of Canada at 29% and USA and international both at 15%. Grande Prairie, perhaps reflecting its location on the route to and from Alaska, reports fewer Albertans (26%), a larger number of other Canadians (33%) and visitors from the USA (22%), and only 8% international visitors. Dawson Creek at the start of the Alaska Highway reinforces the Grande Prairies statistics, with over half of its visitors being from the USA (56%) and 28% being other Canadians.

TABLE 10: VISITOR INFORMATION CENTRE STATISTICS 1998 - 2000

Profile	Number of Visitors		Origin			
	Year	Number	Alberta (%)	Other Canada (%)	U.S. (%)	International (%)
Hinton Travel Alberta VIC						
Most visitors were Albertans visiting Jasper, Lake Louise and Banff	1998 1999 2000	N/A N/A 16,745	N/A N/A 44	N/A N/A 29	N/A N/A 15	N/A N/A 15
Milk River Travel Alberta VIC						
Most early season travelers from USA heading to Alaska. Interest in Calgary, Jasper, Banff, S. Alberta, Badlands.	1998 1999 2000	12,915 11,039 13,433	12 11 9.2	10 8 10.8	73 77 75.5	4 4 4.6
Lloydminster Travel Alberta VIC						
Most Canadians with Edmonton as their destination Interest in Jasper, Banff, Central AB	1998 1999 2000	11,390 11,323 11,925	15 12 13	61 63 64	20 22 18	3 3 5
West Glacier Travel Alberta VIC						
Mostly from USA; RE: Waterton, or Calgary, Banff and Jasper.	1998 1999 2000	N/A 21,354 16,368	N/A 3 2.6	N/A 3 3.9	N/A 87 85.9	N/A 10 7.7
Field Travel Alberta VIC						
Majority from B.C. Germany and UK Interest in Rocky Mountains, Calgary, Drumheller	1998 1999 2000	32,695 27,617 23,850	4 4 17.4	41 46 29.9	27 22 23	28 28 29.6
Grande Cache, Local VIC						
Retired US visitors in spring on way to AK, some international, Albertans (families) in summer	1998 1999 2000	N/A 11,837 13,700	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A
Jasper Local VIC						
Backcountry, other Alberta, BC, Drumheller	1999 2000	163,299 150,989	N/A N/A	N/A N/A	N/A N/A	N/A N/A
Grande Prairie Local VIC						
May to Sept	1998 1999 2000	9,699 7,437 6,814	N/A N/A 26	N/A N/A 33	N/A N/A 22	N/A N/A 8
Dawson Creek, BC Local VIC						
Mostly Alaska	2000	13,340	5.9	28	56	9

Source: Alberta Economic Development, and individual VIC Operators

4.1.4. Alaska Visitor Information

Highlights from the 1998 American Travel Survey of visitors to Alaska are included in the "Town of Grande Cache: Tourism Development and Retiree Attraction Strategy", Ference Weicker and Company. These include:

- The majority of visitors to Alaska travel by air, with about 10% arriving by personal vehicles.
- About 3.6% of visitors traveling to Alaska from out of state stay in a camper, trailer, RV or tent. Therefore, of the almost 1.3 million visitors each year, approximately 50,000 stay in campgrounds or RV parks while they travel.
- Over 84% of out-of-state visitors to Alaska travel without children under 18.
- The average party size is 1.8 people.
- Almost one-half (47.7%) of visitors are over 50 years of age, with the median age being 48 years. More than one quarter (27.6%) are over 60 years of age.
- Three quarters of visitors are married, with 38% being retired and 58% employed.
- Three quarters of visitors to Alaska who are from out of state are on a pleasure trip, either for leisure or visiting friends and relatives.
- Objectives of the trip to Alaska include: rest and relaxation (16.8%), sightseeing (28.0%), outdoor recreation (12.1%), and entertainment (1.8%).
- Washington, Oregon and California are the most common origin states of visitors to Alaska (37% of the 83% of visitors who are from the USA are from the western states)
- Characteristics of Alaska visitors are consistent with the vacation interests identified by the Canadian Tourism Commission as being of primary interest to older travelers. These include:
    - Visiting national parks/natural wonders (53%)
    - Historic Sites (52%)
    - Warm weather/beaches (47%)
    - Sightseeing/autumn foliage (43%)
    - Special events/festivals (30%)
- Key factors influencing travel plans of mature travelers include: Safety (82%), Price (80%), Attractions (78%), Personal Health (76%), and Something New (68%).

4.2. LEARNING VACATIONS

The concept of learning vacations, or holidays with a focus on education and interpretive programming, may be an appropriate form of packaging to consider for the Grande Cache dinosaur track sites.

"Learning vacations" were defined in a 1993 study by The Sage Group as: " Programs which run at interesting locations, dealing with topics peculiar to that location and are normally up to one week in duration. They result in learning something in greater depth than one would on one's own, and the vacation is arranged to attract interested people to remain at that location longer. Social activity and spending time with local people associated with the learning component are also parts of the experience."

Learning vacations or educational adventures are often associated with seniors and older adults, although they are of interest to travelers of all ages, including families and children. The Canadian Tourism Commission (CTC) reports that learning vacations grew by 13 per cent in 1998 in Canada, twice the rate of worldwide tourism. Research from the CTC also shows an increased demand for adventure travel, travel with children, educational travel, and more frequent shorter trips. Tours stressing culture and heritage plus soft eco-adventures are high in popularity. Research further indicates that tourists attracted to a learning vacation tend to be 45-plus, well educated, and curious about the world. They are looking for an experience that gives them contact with the locals within an authentic cultural or historic experience.

A recent survey indicated that 33% of the USA market and 20% of the Asian market are looking for more education packages. Another survey indicated that about 20% of travelers from the United States have taken an educational trip to learn or improve a skill or hobby in the past 3 years, and 18% of travelers from the United States in the past year indicated that taking an educational trip was the main purpose of their travel.

Learning vacations offer an opportunity to tie together educational and interpretive programs with other soft adventure activities in the area.

Learning vacations may be provided by commercial tour operators, or through such unique organizations as Elderhostel, INTERHOSTEL, FAMILYHOSTEL or Smithsonian Institute Study Tours. The following listing identifies some of the types of programs available and that may be options for consideration in the future, once tourism programming at the dinosaur tracks has been implemented.

- **Elderhostel,** Inc. was founded at the University of New Hampshire as a non-profit organization in 1975 in order to provide challenging educational opportunities for older adults. In 1986, Elderhostel Canada was formed to provide programs geared for people in their mid-fifties and beyond. As a non-profit educational/ travel organization, it offers inexpensive short-term academic and recreational programs hosted by educational institutions and program facilitators, including national parks and museums. Programs may include a course in arts or science, leisure learning or recreation, and each includes the formal course component, accommodation, meals and extracurricular activities. There are a wide variety of programs within Canada, on subjects such as photography, hiking, painting and writing. Programs in the U.S.A. and Canada tend to run five to six days during all seasons of the year, and often include classes, field trips, social activities and some free time. There are several programs offered in Alberta, particularly in the National Parks and Calgary area. A five-night program focusing on dinosaurs is also offered in Drumheller by the Royal Tyrrell Museum and the Kneehill Adult Learning Society, from June 3 – 8, 2001. Closer to Grande Cache, the Black Cat Guest Ranch offers Elderhostel programs to discover the Solomon Valley region in February and June.

  The key to hosting Elderhostel and other similar programs is that the learning opportunities must be unique. There must also be local support for the program, and adequate accommodation and food services to accommodate the participants. It may be difficult at the present time to develop a full program in Grande Cache. However, opportunities exist to work with the suppliers of existing programs in the area to see if one or two days to visit/interpret/photograph/paint the dinosaur tracks can be incorporated into those programs.

- **INTERHOSTEL** was developed in 1980 as an international educational travel experience for active adults 50 years of age and older. Its programs are focused on the development of knowledge and understanding of people around the world by learning first-hand about their environment and culture. Continuing Education at the University of New Hampshire sponsors the program in cooperation with colleges, universities, and similar institutions. Each program features an extensive schedule of lectures and excursions, as well as social activities, designed to provide an in-depth look at the host country's customs and culture. Most programs are about two weeks in length. One program, "Canadian Rockies, Lakes and Prairies" is scheduled for the fall of 2001, hosted by the University of Calgary. This program focuses on Calgary and Banff, but includes a visit to the Royal Tyrrell Museum of Palaeontology in Drumheller.

- **FAMILYHOSTEL** learning vacations, started by the University of New Hampshire Continuing Education in 1991, are designed for families with school-aged children, aged eight to 15 years. Adults and children must travel together. FAMILYHOSTEL combines learning experiences with recreational, cultural, and social activities that give families a close-up look at the place they are visiting and its people. No programs are offered in Canada at the present time.

- **Live and Learn Series** at the Banff Centre is described as being like an adventure holiday, providing a chance to escape or experience personal growth. Participants experience programs related to nature, heritage, history, arts and culture. Most programs are focused on the Banff area. They range from single night experiences, often featuring a performance at the Banff Centre, to longer stay adventures.

- **Minerva Senior Studies Institute**, based at Grant MacEwan College in Edmonton, offers learning activities for adults 50-plus in a friendly educational environment. Courses include a presentation series, offering speakers on travel and adventure in distant lands, using lectures, slides, videos and discussions; and a walk-about series, each centring around a specific location/theme, led by knowledgeable hosts.

- **World Wildlife Fund (WWF) Travel** was set up to enhance members' understanding of natural systems and conservation challenges in different parts of the world. Naturalists lead tours to "Global 200" destinations or sites the WWF has identified for priority protection as natural areas of globally outstanding importance. Collectively known as the Global 200, these areas represent nature at its best. Conserving these most outstanding terrestrial, freshwater, and marine ecoregions will protect some of the most diverse habitats, endangered wildlife, and ecological processes that maintain the web of life. The type of trips offered this year include a six day study of Grizzlies and Wildlife in British Columbia in September, and a nine day Great Wildlife Hikes of the Northern US Rockies in July. Programs combining tours of the track sites with caribou and other wildlife viewing may be possible in the longer term in the Grande Cache area.

- **The Smithsonian Institute Study Tours** program offers a range of unique study tours, escorted by top educators. These include accommodation, meals, lectures, sightseeing, special activities, and transportation while touring. A seven-day program entitled "Dinosaur Encounters in Alberta" is scheduled in conjunction with the Tyrrell Museum and Dinosaur Provincial Park from June 15 - 21, 2001.

The Great Canadian Fossil Trail Product Club (TGCFT) is another initiative that should be noted in the context of learning vacations and comparable marketing initiatives. Affiliated with the Canadian Tourism Commission (CTC), the TGCFT is in the product development phase. It's intent is to bring together facilities and attractions offering dinosaur and other palaeontological resources across the country, and help them cooperatively market their facilities and programs. At present, membership in the Great Canadian Fossil Trail is mostly from Western Canada, but efforts are underway to expand it to include all of Canada and even other parts of North America and the world

A goal of the Great Canadian Fossil Trail Club is to have a web site and develop guidebooks that will provide information on the various member sites. When someone visits one site, they will be able to find out about other similar or related sites elsewhere. It is not intended that they would tour around visiting all of the sites on one trip, although this could be done. The intent is to have them learn about other places to visit and encourage them to plan future trips accordingly.

Continued membership in this Club provides an opportunity to develop and market linkages with other sites, such as the Burgess Shale Fossils in Yoho, the Grande Prairie Museum and the dinosaur bone beds south of Wembley, or the Royal Tyrrell Museum of Palaeontology.

4.3. POTENTIAL VISITOR PROFILE

An attempt was made while completing this tourism opportunity analysis to develop profiles of what potential visitors might be like who want to see dinosaur tracks. This has not proven to be an easy task.

When talking to other dinosaur related sites and attractions across Alberta and Western North America, it was found that, unfortunately, most do not keep records of the demographic characteristics of their visitors. In addition, sites that do have some information on the characteristics of their visitors are not directly comparable to the Grande Cache situation. For example, the Royal Tyrrell Museum of Palaeontology is located within a 1.5 hour drive of Calgary and a 3 hour drive of Edmonton, giving it a much larger population base on which to draw for day trips, school group tours, and so on. As a result, their visitor numbers and types of visitors will be different than what can be expected in Grande Cache.

Many of the sites indicated that "everyone loves dinosaurs", making them a possible attraction for all ages and interests. This suggests, then, that the best place to start marketing for Grande Cache is to build on the existing base of visitors, providing them with a new and unique tourism product.

The Grande Cache Operators Marketing Plan for 2001 identifies the following target groups for marketing adventure products, which are also compatible with marketing tours to the dinosaur track sites:

- Families with pre teen children
- Adult groups, couples, industry workers
- Youth groups
- Seniors
- Hunters/fishermen

These consumer segments are characterized as being outdoor enthusiasts aged 25 – 40 years who are interested in camping, hiking and biking, as well as active urban professionals and others interested in soft adventure activities. For the dinosaur tracks, it may be possible to also include families, as well as seniors and others who are interested in learning vacations, particularly for those traveling through the area along the Alaska Highway route and for those seeking out specific palaeontological attractions as a result of the shared marketing efforts of the Great Canadian Fossil Trail.

The Grande Cache Operators Marketing Plan has also identified target markets and expected percentages of visitors from each. This again provides a reasonable starting point for marketing the dinosaur track sites, especially if packaging them with other activities is considered. The target markets suggested for the Grande Cache area and the percentage proportion of visitors anticipated from each, are as follows:

- Local Residents, primarily on day trips: 20%
- Regional Residents within a 2 hour drive of Grande Cache (e.g., Grande Prairie and Hinton) on day trips, multi-day trips, or taking an alternative route to other destinations: 30%
- In- Alberta Residents within a 5 hour drive (e.g., from Edmonton and Northern Alberta), on multi-day or weekend outings with an activity orientation: 20%
- National Residents, primarily from Western Canada, seeking a new destination with an activity orientation: 20%
- International Visitors, primarily Fully Independent Travelers (FIT) from the USA, Europe and Asia, seeking mountains and a natural setting, or as an add-on experience to tours: 10%

As a starting point, the above targets appear quite reasonable for the dinosaur tracks. However, as the product develops, it would seem that the proportion of visitors from the USA may increase to be more reflective of the number of residents of the USA that travel through the area, as demonstrated by the visitor statistics at both the Grande Prairie VIC (22%) and the Hinton VIC (15%).

Marketing of the dinosaur track sites will require cooperative effort with the Tourism Board and other operators in the area. The Grande Cache Tourism Operators Association identified other tourism opportunities having potential significance in the area when they developed their marketing plan, including the dinosaur tracks and development of a facility related to them. While there are no marketing initiatives specifically related to the dinosaur tracks identified in the plan, marketing of them can readily link into opportunities that are included.

5. BEST PRACTICES OVERVIEW

5.1 INTRODUCTION

A number of sites and facilities related to the management and provision of interpretive programming and display of palaeontological resources were identified. These sites were then contacted in order to compile general information on visitor use, marketing, programming and best practices in terms of development and resource management and protection. Respondents varied from museums and dinosaur theme parks to guided tours and state run facilities. Overall, most sites and facilities were developed initially from a small-scale idea based on a discovery, to a full-scale attraction. The resource was generally developed into an attraction in order to cover the costs of its protection.

Sites were also asked to relate their experiences with palaeontological resources to the trackway in Grande Cache, identifying how they would promote the resource while attempting to maintain the historic and palaeontological integrity.

5.2 PROTECTION OF, AND ACCESS TO, PALAEONTOLOGICAL RESOURCES

There is a degree of similarity between all of the sites and facilities that responded to the survey. Palaeontological resources MUST be protected from both human disturbance and natural weathering if they are to be preserved for future enjoyment and education. If left in-situ and allowed to weather naturally, managers reduce the risk of damaging the resource by attempting to transport it to another location; however, the risk of loss of the resource over time will increase.

One respondent noted that, in order to further research and promote their resource (a full T-Rex skeleton), they had to remove it, or it would have turned to dust over time. Dinosaur Ridge, Colorado, which displays a trackway from the Cretaceous Period, has left the tracks to weather naturally. However, in order to protect the resource from vandalism, which has occurred in the past, they have fenced the main tracks from public access (figure 1). Guided tours to the site are allowed with controlled access to the tracks. Most areas offer both self-guided and guided tours in their facilities; however, wherever there has been uncontrolled access to the resource, damage has occurred.

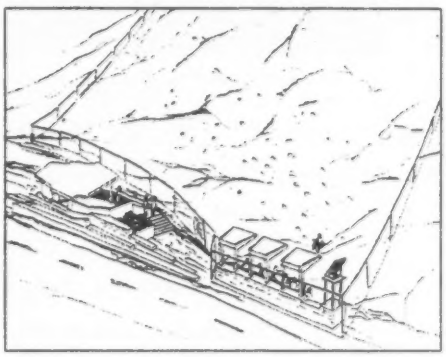


Figure 1. Artist's Rendition of Fencing Improvements to Trackways at Dinosaur Ridge, Colorado

The Yoho Burgess Shale provides an example of incurred damage due to uncontrolled access. When the Burgess Shale site was originally discovered, there were a number of fossil thefts. This resulted in Parks Canada designating the site as a *National Parks Special Protected Area*, zoning it as "closed" to the public. Access to the area is strictly enforced, allowing only one organization to guide public visitors to the site for interpretive purposes. The area is fenced and enclosed and a 24-hour surveillance camera monitors the site for any vandals or possible thieves.

5.2.1. Applicability to Grande Cache

There were a number of protection measures listed in the survey that relate directly to the dinosaur trackways in Grande Cache. Of them, the key concerns voiced by other industry operators were the following:

1. Protection Issues and Measures
   Visitor traffic in the area
2. Access to the site
   Availability of other tourism facilities and services
3. Access to the area
4. Quality of the resource

Comments such as, *"people are the problem"* and *"if the site is not constantly watched and you promote visitation it will be vandalized"* were noted in the surveys. However, it appears that with guided access, fencing and regular patrolling, most protection issues, from a public access perspective, can be reduced and/or eliminated. One respondent writes the following, *"if you have something as precious and exciting as a dinosaur track site, then the site should receive special status and protection. Then scientists and the public should have access via professionally guided tours"*.

Respondents to the survey indicated that their facilities' experiences with protection issues and measures might be similar to those encountered by Grande Cache; however, *"through control measures, and visitor education on all promotional materials, signage, etc... most problems can be avoided"*. Proactive measures rather than reactive measures appear to be the soundest solution to protection issues.

There was a general level of excitement throughout the respondents' comments in reference to the existence and discovery of the trackways in Grande Cache, regardless of whether the respondent was aware of the site. All respondents voiced interest in promoting the Grande Cache trackways, be it through a brochure displayed at their site, or by taking tours to the former coal mine.

5.3. INTERPRETATION AND EDUCATION FACILITIES

Some sites that are fortunate enough to have both on and offsite interpretive opportunities, allow the public to self-guide through their museums, visitor centres, or display areas. In order to protect those resources left in their natural states, the site manages them directly or contracts with trained guides to transport groups to the areas and interpret the resource under strict controls. These types of excursions include *"Dig-for-a-day"*, *"Follow the dinosaur trail"*, etc., where individuals or groups (school, college/university, families, day camps) join a "real life scientist" on a dig. Longer excursions from one-day to ten days are also offered by number of sites, as well as by organizations such as the Smithsonian Institute and the Tyrrell Museum. Almost unanimously, respondents indicated that hands-on interpretation has been the most successful type of programs. Another success has been the use and employment of trained guides/scientists, whose knowledge and understanding of the site is both thorough and in-depth.

5.3.1 Development Felt to be Appropriate for Grande Cache

Of the types of development listed in the survey, respondents ranked the following the highest in terms of being appropriate in Grande Cache:

1. Interpretive programs onsite
2. Guided Tours
3. Special Events/Programs
4. Interpretive Signs/Displays
5. Self-guided tours
   Interpretive Centre
6. Trails/boardwalks/handrails
7. Controlled digs
8. Scientific Research Station
   Interpretive programs offsite
9. View Points
10. Lighted Evening Programs

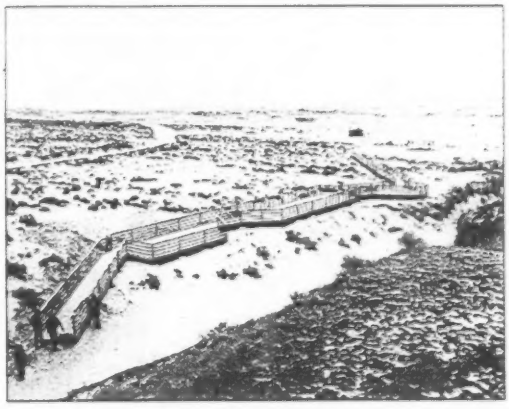


Figure 2. Boardwalk Under Construction in Wyoming

The Bureau of Land Management's Red Gulch Dinosaur Track site in Worland Wyoming submitted an example of a development at an existing site, currently under construction. Although the track site at Red Gulch has been preserved horizontally, the boardwalk is an example of another way access to track sites may be controlled.

5.4. VISITOR SAFETY

Whatever measures are implemented to protect the resource from vandalism, damage or theft, another reason for controlled access (be it through fencing, guided tours, etc.) indicated by other site managers, is visitor safety. One respondent indicated that the very reason why they had implemented protection measures was to decrease their risk of liability. Another site uses the *"Vanosaurus"* to transport its tour participants to and from their site. Not only is the name effective for marketing, it ensures that access to the site is by company vehicle only.

5.5. FINAL THOUGHTS BY RESPONDENTS

All respondents agree that no matter what age, educational background or physical ability, *"everyone loves dinosaurs"*. People are willing to travel over long distances through not ideal conditions to see sites such as the trackways in Grande Cache; however, should the public be given free reign on access to the site and its surrounding fossils, damage is more than likely to occur. Through effective programming, using trained guiding personnel, and supplemented by informative hands-on experiences either on or offsite or with replicated artifacts, the dinosaur footprints and trackways in Grande Cache, should be promoted, enjoyed and studied for many years.

6. ASSESSMENT OF DINOSAUR FOOTPRINTS AND TRACKWAYS

6.1. CRITERIA FOR SCIENTIFIC ASSESSMENT OF TRACK SITES

Some criteria that can be used in assessing the importance of a track site or group of track sites in a geological formation are:

a) Historical significance: first finds, important researchers involved, etc.
b) Rarity of footprint types: are these types of footprints found anywhere else.
c) Distinct associations of different footprint types
d) Diversity of footprint types: how many different footprint taxa (types) are present.
e) Unusual or previously unrecorded behaviors: evidence of herding, predator-prey interaction.
f) Association of footprint types with certain substrates: evidence of environmental preference
g) Impressiveness of site in terms of preservation and orientation of the surface for viewing: are the footprint-bearing surfaces easily viewed and are the footprints distinct and visible.
h) Degree of visibility/recognition in the scientific community and general public: number of scientific publications and appearance in popular books, magazines, newspapers, documentaries, etc.

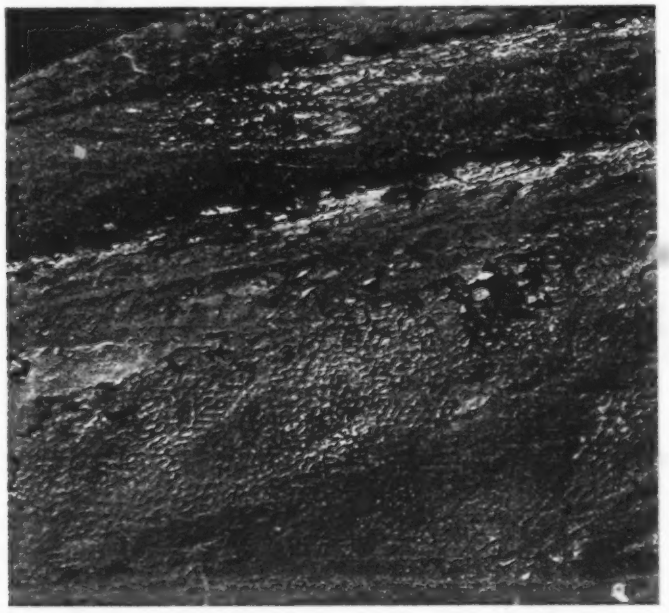
6.2. ASSESSMENT OF THE IMPORTANCE OF THE GRANDE CACHE TRACK SITES

The first research on footprints at Grande Cache is in the very recent past, but was begun by Dr. Philip J. Currie of the Royal Tyrrell Museum of Palaeontology, a widely respected and well-known vertebrate palaeontologist.

The vertebrate footprint fauna is dominated by *Tetrapodosaurus borealis* footprints. These have been interpreted as being produced by nodosaurid ankylosaurs (Carpenter, 1984). *T. borealis* footprints were first described from the Gething Formation (Aptian) of British Columbia from only two short trackways (Sternberg, 1932). Very few footprints attributable to ankylosaurs have been found worldwide (McCrea, *et al.*, in press), making the Gates Formation track sites scientifically important and unique on a global scale.

The *Tetrapodosaurus borealis* footprints are found in multiple trackways in parallel orientation (W2 Site), providing evidence of herding behavior. This is the first record of herding behavior of adult ankylosaurs in the world. These are animals that have typically been interpreted as being solitary, based on the comparative rarity of skeletal remains.

Additionally, these are the only track sites in Canada, and are also among a handful in the world, where avian footprints and dinosaur footprints occur together on the same surface. There is a large diversity of footprint types (five dinosaur and one avian taxa, with at least another two or possibly more avian ichnotaxa currently being described). There appears to be a distinct difference in footprint types related to substrate (low energy, high organic content - higher energy, lower organic content). Few track sites display evidence of habitat preference over such a short distance (i.e., E2 Pit to W3 Corner track sites is a distance of 4 km).



W2 Track Site, Photo courtesy of Richard T. McCrea

The Grande Cache track sites are impressively displayed on tall footwall exposures. When lighting conditions are right, the footprints are very easy to see. Several thousand footprints are visible on the footwalls, a fortunate condition rarely seen on this scale. A majority of track sites in the world show only partial trackways or are located on flat surfaces, making viewing difficult for the public.

The Grande Cache track sites fill many of the criteria for assessing the importance of track sites given above. Some of the criteria, particularly recognition by the scientific community and general public, will hopefully increase with time. The degree to which such recognition occurs is directly related to the commitment to future scientific research of the track sites.

6.3. RANKING IN COMPARISON WITH OTHER TRACK SITES

Using the criteria given above, the Grande Cache track sites would be ranked among the top five in North America and top ten in the world. It should be noted that this is a subjective assessment, based on the expert knowledge of Richard McCrea, and only considers Mesozoic track sites.

6.3.1. Other North American Track sites

The other track sites in the top five in North America include:

- **Connecticut Valley (Newark Group - Triassic) - (Lull, 1953):** The first footprints to be described and to become widely known. There is a great diversity of footprint types. Most of the footprints are found on level surfaces or are found in broken blocks. They are abundant in some localities, but are found over large areas. Edward Hitchcock, considered the father of modern vertebrate palaeoichnology (study of fossil footprints), described these prints. Hitchcock's footprint collection can be viewed at the Pratt Museum of Amherst College, Amherst, Massachusetts. This museum holds the largest collection of footprints in the world. Few people would dispute the number one position of this track site in importance worldwide.

- **Peace River (Gething Formation - Cretaceous: Aptian) - (Sternberg, 1932):** The first and for a long time, the only major footprint exposures in Canada. Charles M. Sternberg described this diverse footprint fauna in the 1930's. He is one of the sons of Charles H. Sternberg who worked for Edward Drinker Cope, an extremely well known American vertebrate palaeontologist in the 1800's. E.D. Cope and C.O. Marsh were the two major rivals that started the famous "bone wars" in which they both rushed to describe as many dinosaur species as possible in order to outbid each other. Between them they named some of the best-known dinosaurs in the world.

  In the mid-1970's Dr. Philip J. Currie led four expeditions to the Peace River Canyon in British Columbia to record as much information and collect as many specimens as possible before the track sites were flooded between the W.A.C. Bennett Dam and the newly constructed Peace Canyon Dam. The first ankylosaur footprints (*Tetrapodosaurus* ichnosp.) were described from these track sites. The majority of footprints preserved are those of bipedal herbivores (*Amblydactylus* ichnosp.), as well as many bipedal carnivores of various sizes. The first fossil bird footprints found in Canada were described from these deposits (Currie, 1981). There is also impressive evidence of herding behavior of hadrosaurs from multiple parallel trackways (Currie, 1983; Currie & Sarjeant, 1979).

The composition of the Peace River footprint fauna is similar to that found near Grande Cache. All footprint types found in the Gates Formation near Grande Cache were first described from research in the Peace River Canyon. The proportions of footprint types is quite different between these two formations, and the Gates Formation does not quite have the diversity of dinosaur footprints as the Gething Formation, although the Gates Formation does display greater diversity of avian footprint types. Since the Peace River Canyon track sites are now flooded between two dams, no viewing is possible.

- **Morrison Formation (i.e. Purgatoire Valley in Colorado and others - Jurassic) - (Lockley, 1997):** The Morrison Formation is famous worldwide for its dinosaur skeletons and was one of the focal points of the Marsh-Cope "bone-wars". The track sites found in the Purgatoire Valley show several trackways of brontosaurs traveling in a herd. The footprints are preserved on level ground. Dr. Martin G. Lockley, head researcher for this site, has authored many papers and books on footprints and is considered one of the leading experts on footprint research in the world. The track site is located 23 miles from the town of La Junta in Otero County, Colorado. Access is possible, but difficult as it is bordered on one side by US Army training grounds and there are no vehicle access routes from any other areas. A 10.6 mile roundtrip hike from Withers Canyon access off Rourke Road is possible, but this type of exertion is beyond many tourists.

- **Glen Rose Formation (Davenport Ranch, Paluxy site in Texas - Middle Cretaceous) - (Lockley and Hunt, 1995):** Footprints from the Glen Rose Formation have been known since the early 1900's, but their importance became appreciated in the 1940's when Roland T. Bird conducted research on the first recognized brontosaur trackways from the Paluxy River site. This track site (on level ground) provided unequivocal evidence that sauropods walked with their legs directly beneath them, not splayed out like a lizard. These trackways also proved that sauropods could walk fully on land which contradicted the persistent idea that sauropods could only live in lakes and swamps due to their large bulk. There is also a very interesting association of brontosaur footprints and the footprints of a large meat-eating dinosaur that has been interpreted as predator-prey behavior (stalking and perhaps an unsuccessful attempt at a kill). The Paluxy site has also been the unenviable focus of creation "scientists" who claim to have found supposed "human footprints" associated with dinosaur footprints. These purported human footprints are just poorly preserved carnivorous dinosaur footprints (Milne and Schafersman, 1983).

The track sites are located in a riverbed and may be viewed when the water levels are low, but the footprints are often flooded when the river is high. Some footprint specimens may be viewed at the Texas Memorial Museum and the American Museum of Natural History in New York. The Davenport Ranch site is also in the Glen Rose Formation and shows several trackways of brontosaurs that have been interpreted as a structured herd (with adults protectively surrounding juvenile animals).

6.3.2. Other Top Ten Sites in the World

Other top ten sites in the world include:

- **Lark Quarry site, 100 Km south of Winton, Queensland Australia – "Middle" Cretaceous (Thulborn, 1990):** This track site is fairly diverse, and has several thousand footprints on a continuous surface which is level, but it is mainly known for its possible predator-prey interaction interpretation of the trackways. Many very small, chicken-sized dinosaur trackways are oriented in one direction - toward a trackway of a large meat-eating dinosaur. Apparently the large meat eater surprised a large group of smaller dinosaurs, trapping them at the water's edge. The smaller dinosaurs panicked and stampeded in the direction of the large predator, a behavior known in biology as "predator swamping". Dr. Richard Anthony "Tony" Thulborn was the primary researcher on this track sites and is a well-known fossil footprint expert and author of several scientific papers and books.

- **Cabo Espichel, Portugal - Late Jurassic (Lockley and Meyer, 1999):** This track site shows seven brontosaur trackways in parallel orientation (herding). The site is located on a moderately steep cliff face. Dr. Martin G. Lockley was involved in the recent documentation of this track site. This is one of five dinosaur track sites in Portugal that have been designated as national monuments.

- **Cal Orko, Bolivia - Late Cretaceous (Leonardi, 1984; Thulborn, 1990; McCrea et al., in press):** The footprints are located on a steep slope in a limestone quarry high in the mountains. At this site are found footprints named *Ligabuichnium* ichnosp. which were produced by medium sized quadrupedal dinosaurs (herbivores). Research on the affinity of *Ligabuichnium* ichnosp. footprints is still ongoing, but they have been tentatively attributed to ankylosaurs. The footprints occur above 8,000 feet which might be considered as difficult to reach for tourism purposes.

- **Fumanya, Barcelona, Spain - Late Cretaceous (Lockley and Meyer, 1999):** A large track site (over 10,000 m^2) on a steeply dipping slope (~60°) in which several lengthy brontosaur trackways are found. There are few parallel trackways, but these footprints are among the last records of brontosaurs and the site has been describe by Lockley and Meyer (1999) as picturesque and high up in the Pyrenees Mountains.

- **Munchhagen, Hanover, Germany - Early Cretaceous (Lockley and Meyer, 1999):** Lockley and Meyer (1999) describe this site as "...undoubtedly one of the best-developed dinosaur track sites in Europe,..., which attracts around 150,000 visitors every year." The track site is enclosed in a 3,500 sq metre glass hall to protect the footprints at the Open-Air Dinosaur Museum. A 2.5 km tour leads the visitor through various ages in the history of the earth. There are over 100 full-size dinosaur reconstructions of up to 45 metres in length Sauropod (brontosaurs) and ornithopod (bipedal herbivorous dinosaurs) footprints are present. Information is available at:
http://strategicnewspapers.com/da/070100/dp0701/foot.htm

6.4. CRITERIA FOR ASSESSMENT OF TOURISM MARKETABILITY OF DINOSAUR TRACKS

Some criteria that can be used in assessing the importance of dinosaur track sites from a tourism perspective include:

a) Rarity of footprint types: are these types of footprints found anywhere else?
b) Visibility of track sites in their natural location
c) Access to the site, including land ownership
d) Safety, ease and cost of access to the site
e) Interest in/commitment by local operator/group to coordinate development and operation of tourism attraction
f) Availability of other attractions in immediate area
g) Availability of other tourism services in area (food, beverage, accommodation)
h) Level of awareness of Grande Cache and area as a tourism destination
i) Linkages with other related attractions to enable development of tours/increase awareness
j) Opportunities for interpretive programming

6.5. TOURISM POTENTIAL OF GRANDE CACHE TRACK SITES

The Grande Cache area and dinosaur track sites were reviewed in the context of the tourism marketability assessment criteria identified in Section 6.4. Overall, tourism marketability of the track sites looks very positive. The assessed scientific value of the track sites is very high, as noted in Sections 6.2. and 6.3. As a result, tourism criteria "a" and "b" rate highly.

Vehicular access to the sites is possible along haul roads formerly used by SRCL as long as appropriate approvals and "consent" agreements are arranged. At present, there are no dispositions on the track sites, although reclamation activities are underway in the area. This means that, while there is currently public access "at the users risk" along the Smoky River haul road, direct access to the track sites along 9 and 12 Mine haul roads is restricted via gates and locks. Once coal mining and other resource applications have been resolved and operations begin again in the area, it will be possible for application to be made for a disposition that will enable development of limited facilities at the track sites on an exclusive use basis. If and when mining or other resource activities begin, there will potentially be conflicts between mining trucks (noise, dust and safety factors) and tourism use. Access to the track sites is most feasible using vehicles that have heavy-duty suspension and multi-wheel drive, since the haul roads are not maintained to highway standards. Controlling access will also be necessary for both protecting the resource and safety reasons, particularly when there are active mining operations on going.

Local interest appears to be high in terms of developing a tourism product and programming at the track sites. There is also interest from tour operators in developing tours to include the track sites and other attractions in the area. Guided tours to the track sites could include visits to other interesting and scenic attractions, such as the Sulphur Gates, or participation in other adventure tourism activities. It's location in a scenic mountain setting, with opportunities for wildlife viewing also adds to the appeal of the area. Comments received while doing the research for this report noted that good quality photos of the area are not readily available at present for use by tour operators in developing packages that include activities in Grande Cache.

The Town of Grande Cache and surrounding area provides a range of basic services necessary for tourism, including accommodation and food services, although luxury type accommodation is lacking.

At the present time, awareness levels about what Grande Cache has to offer as a tourism destination are limited. That said, the recent paving of Highway 40 has led to increased use of the route for travelers to and from Alaska. The success of marketing initiatives relative to the adventure tourism products in the area, including such special events as the Death Run and Death Race, are helping to put Grande Cache on the tourism map. In addition, several linkages relative to the dinosaur tracks have been identified that can be developed to help increase visitation to the area (e.g., Great Canadian Fossil Trail and links with facilities like the Grande Prairie Museum).

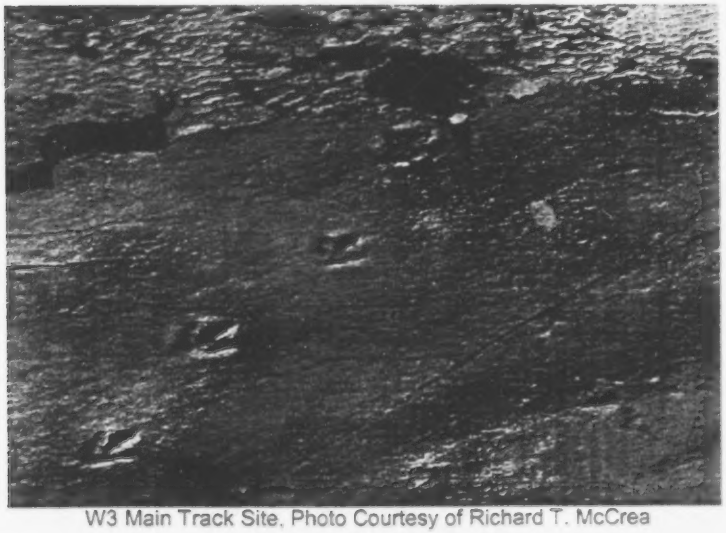
Of the eighteen dinosaur track sites identified in the Grande Cache area, nine have some potential for tourism programming. The remaining sites are too remote, too dangerous, or have footprints that are too indistinct to be visible to the average visitor.

The potential sites are listed below in rank order of their significance for tourism, with particular emphasis on criteria a, b, c and d.

1. The four sites referenced as the W3 sites rank highest in terms of diversity (number of different footprint types) and of viewing potential (although this last quality can vary greatly with lighting conditions). The quality of the footprints is impressive, making identification quite accessible to the layperson (with the help of an interpretive key). There are no other track sites known in Canada (and few places in the world) where one can view so many footprints (est. 10,000 for W3 Main alone) at one site.

These track sites are continuous along a 600-meter long portion of a footwall, which in most areas exceeds 50 meters in height. The footprints occur as natural moulds (i.e. they are impressions as opposed to infillings or natural casts) and many lengthy trackways (sequences of footprints made by individuals) are present. The footprints of bipedal animals are dominant over those of the quadrupeds.

W3 Main Track Site, Photo Courtesy of Richard T. McCrea

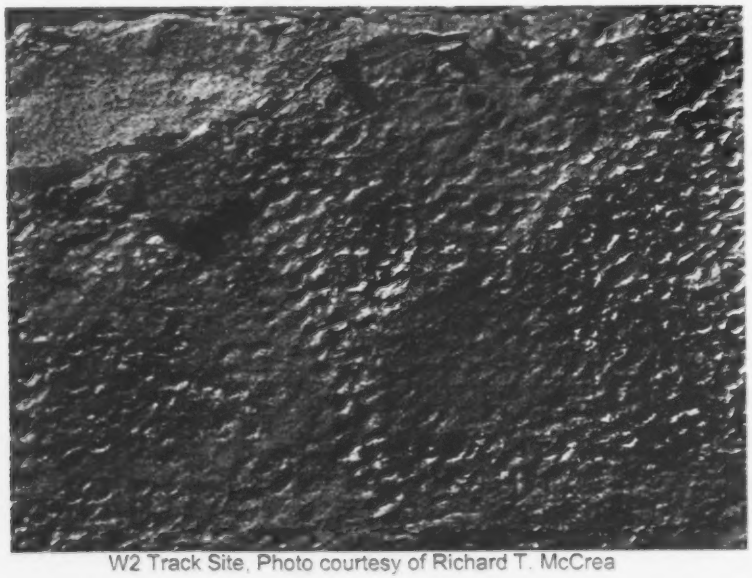


W3 Main Track Site, Photo Courtesy of Richard T. McCrea

W3 Track Site, Ankylosaur Imprint, Photo courtesy of Jan Bloomfield

2. The W2 site, second in terms of diversity, is almost equal to the W3 sites in terms of viewing potential. The quality of the footprints is good, and individual trackways should be easy for almost anyone to identify. There are estimated to be over 1500 footprints at this site.

   This track site is about 150-200 meters long and about 10-15 meters high. The footprints occur as natural moulds, with many lengthy trackways present. The footprints of quadrupedal animals are overwhelmingly dominant over those of the bipeds.



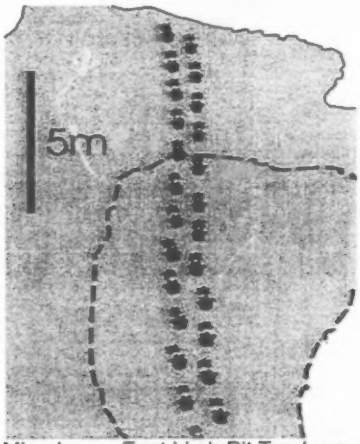
W2 Track Site, Photo courtesy of Richard T. McCrea

W2 Site Theropod Footprint, Photo courtesy of Richard T. McCrea

3. The 9 Mine (Lower East Limb Pit) is one of the first track sites discovered in this area, and was largely excavated with considerable skill and effort by Tyrrell Museum staff. The single trackway is quite visible and is quite striking. It ranks as number three in the track sites under consideration here. There are approximately 100 or more footprints here.

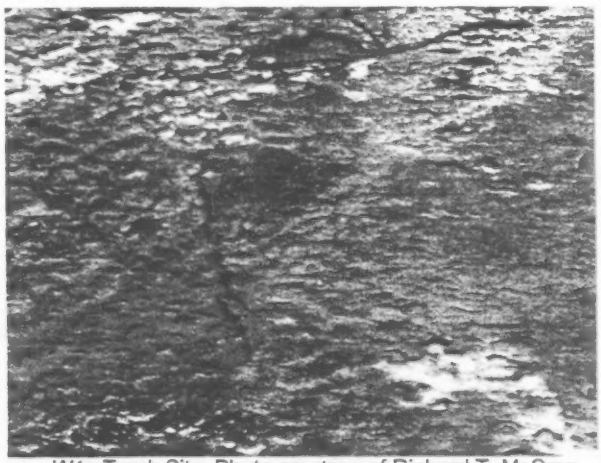
   This relatively small track site is only about 25-35 meters across and perhaps 20 meters high. Its most notable feature is a single *T. borealis* trackway that was excavated by staff of the Royal Tyrrell Museum of Palaeontology in the early 1990s. A few other trackways are present, but are visible only under the most favorable lighting conditions. The footprints occur as natural moulds and there are some *in situ* tree stumps present as well.

9 Mine Lower East Limb Pit Trackway, Photo courtesy of Richard T. McCrea



Drawing, 9 Mine Lower East Limb Pit Trackway, Courtesy of Richard T. McCrea

4. Given that there is only one footprint type visible and that they are generally indistinct, Sites W1a and W1b are among the lowest ranked sites under consideration here. They are still interesting to see if viewing conditions are favorable and the "dinoturbation" idea should be quite entertaining to a tour group. There are about 300 or more footprints at these sites.


W1a Track Site, Photo courtesy of Richard T. McCrea

These track sites occur along a 200-meter portion of a footwall that generally exceeds 50 meters in height. The footprints occur as natural moulds and some short trackways are present, although the number of footprints intermingling on the site is so great (dinoturbated) that individual trackways are difficult to recognize. There are some small to medium size *in situ* tree stumps with radiating root systems, but these may be difficult to see from a distance.

5. The Center Limb Pit site is a recently discovered track site and its' most impressive feature is the surrounding geology rather than the footprints. As a footprint site it ranks last in the sites under consideration here. There are less than one hundred footprints at this site.

   This track site is fairly small although it is located in very impressive surroundings (on the side of an excavated anticline fold axis). There are only a few short trackways present and the footprints are natural moulds.

9-Mine Center Limb Pit Anticline, Photo courtesy of Richard T. McCrea

7. SCENARIOS REGARDING TOURISM PRODUCTS/PROGRAMMING

Several scenarios are outlined below regarding tourism programming and development of the dinosaur track sites. As noted earlier, direct vehicular access to the site is currently limited and only available on a special arrangement basis through the local land manager.

Four scenarios are presented below relative to the types of tourism programming that could be considered onsite at the track sites, along with some of the implications for tourism in Grande Cache. A common scenario involves additional development and programming that could occur at the Visitor Centre or elsewhere in Grande Cache to provide offsite interpretation of the dinosaur track sites, as well as support services and activities for visitors.

7.1. SCENARIO 1: STATUS QUO, ACCESS ONSITE BY SPECIAL ARRANGEMENT ONLY

7.1.1. Type of Development/Programming

This scenario is basically one of "do nothing". It would be characterized by the following:

- There would be no development or improvements onsite, no organized or guided tours, and no long-term commitments regarding access.

- There would be no local non-profit group formed to coordinate and manage access.

- Vehicular access to the track sites would only be through individual arrangements by tour companies or others who obtain special permission from Alberta Sustainable Resource Development. Providing appropriate liability insurance and indemnification will be essential. Over the longer term, it is conceivable that the local land manager may become increasingly reluctant to authorize occasional forays of an unorganized nature.

- The only interpretive programming would be through the current offsite displays at the Grande Cache Visitor Centre, with possibly some additions or modifications to these over time. In addition, other sites, such as the Grande Prairie Museum or the Royal Tyrrell Museum of Palaeontology, may provide some displays relative to the Grande Cache track sites.

- There would be no formally developed interpretive programs or materials, other than what the Visitor Centre might develop for use by tour companies who include a track site visit on their itinerary. The training of certified guides to lead tours and deliver programs would not be cost-effective, since there would be no formalized access to the sites.

- This scenario also leaves the door open for an operator from outside of the Grande Cache area to apply for a disposition to develop a commercial operation that would be managed from outside of the area. This would result in limited economic benefits for the Town of Grande Cache, and would also deprive the community of the opportunity to locally manage this significant resource.

7.1.2. Implications for Tourism in Grande Cache

- This scenario would have minimal impact, either positive or negative, on the economy or tourism industry in Grande Cache.

- Further marketing or promotion of the dinosaur tracks by the Grande Cache Tourism Board would not be cost effective since access would not be assured. In effect, the track sites would remain unavailable as a tourism product.

- Any tours provided would be on an ad hoc basis, most likely as part of a tour organized by operators from outside of the area. While they might include a stop in Grande Cache for a meal, most of the proceeds from the tours would not stay in the community.

- There might be occasional visits to the site organized by special interest groups, perhaps using local services. However, there would be no scheduled tours, no opportunities for packaging visits to the track sites with other activities and attractions in the area, and no ongoing opportunities for employment or revenue generation related to the provision of guided tours to the track sites.

- In addition, unless there is a protective notation or historic resource designation by Alberta Community Development, there would be limited long-term protection of the track sites. If a local group does not take a special interest in the sites, there is a strong likelihood that the sites will be vandalized and the potential for tourism will be diminished, particularly once reclamation in the area is complete and the road access is no longer gated.

- Because of the limited positive impact on the community and local tourism industry, this scenario is strongly not recommended.

7.2. SCENARIO 2: NO DEVELOPMENT ONSITE, CONTROLLED ACCESS ONLY TOURS PROVIDED BY LOCAL GRANDE CACHE GROUP

7.2.1. Type of Development/Programming

This scenario would involve creating a local entity, such as the "Friends of the Dinosaur Tracks" or other non-profit society, to coordinate and manage tourism use of, and access to, the track sites. There would be controlled access to the sites only through tours provided by a local group, with no development onsite. It would include the following components:

- Access to the site would be by guided bus/van tours only. These tours would be provided on a regularly scheduled basis or as specially arranged tours, departing from the Visitor Information Centre using small buses or vans (maximum 20 passenger capacity), appropriately equipped with heavy duty suspension, multi-wheel drive, etc.

- Agreements or "consent" for vehicular access to the track sites will be required with the Provincial government as local land manager, and/or resource companies active in the area of the access roads. The Tourism Board, Friends of the Dinosaur Tracks, or local tour operator will not have control over access, simply because of the high costs associated with assuming responsibility for road maintenance and reclamation costs.

- There would be no facility development, fencing or signing at the track sites. However, it may be necessary to have some improvements onsite as a required condition of access. For instance, roadside pullouts or turn around areas may be essential when and where active mining operations resume.

- Tours would involve driving a bus to the sites and allowing guests to view the track sites. Guests may be allowed to get off bus to better view the sites, but would be required to remain at the roadside pullout or a designated safe viewing area.

- Local tour guides would be trained and certified, and would accompany each tour bus. The guides would provide professionally developed interpretive information about the track sites and other related themes, using reference materials to assist in describing the resource. Hand out materials would be provided to participants on the tour.

- Developing and providing the interpretive materials/albums regarding dinosaurs, footprints, and other themes (geologic processes, coal mining, etc) for use in tours, as well as developing the training program for training and certifying local guides to lead all tours to the sites, would be part of the role of the local non-profit society.

- The local non-profit society would either purchase an appropriately equipped vehicle that could withstand the adverse road conditions in accessing the site, or contract with a local operator to provide this service.

- Tours of about 3 hours in duration would operate from the Visitor Information Centre. Visitors taking the tour would be charged a fee calculated to cover operating expenses, liability insurance, and provide a reasonable profit margin. Differential rates would be assigned for adults, children, families, groups and seniors.

- The local non-profit society should consider some value added components to justify the cost of the tours, such as providing boxed lunches snacks and other souvenir items.

- This scenario (along with Scenario 3) means that control of tourism programming relative to the track sites remains local.

- Possible "higher end" helicopter tours with a stop at the track sites may be possible in combination with "flight seeing" options over area attractions, depending on safety considerations, such as wind, dust, and mining traffic.

- Long-term protection of the track sites through protective notation or historic resource designation is critical, and the Tourism Board and the local non-profit society should actively pursue this and encourage designation to occur.

- This scenario would result in increased tourism benefits for Grande Cache, although potentially not as many as in Scenario 3. While it may reflect the interim situation until any limited development may occur at the track sites, it is not the preferred scenario.

7.2.2. Implications for Tourism in Grande Cache

- The provision of regularly scheduled bus tours to the site on a controlled access basis would provide an opportunity for the formation of a local group (Friends or Non-Profit Society) to organize the tours, thus ensuring that any economic benefits return to the community. This group could either purchase a vehicle to use in delivering the tours or contract with a local company to provide this service, in either case providing employment opportunities locally for the driver/operator of the bus tour.

- Since access to the site would be by guided tour only for which fees will be charged, several certified guides from the local community would be trained to provide this service, either for regularly scheduled tours or for specially arranged tours as "step-on" guides. Guides could include both year round residents and students for seasonal employment. Interpretive materials, including scripts and reference materials for guides and some hand out materials for participants of the tours, would be developed locally. This material could be distributed on a cost recovery basis as part of the tour price and experience.

- A guided tour to the site will take 3 to 4 hours, meaning that participants will likely have at least a meal, and perhaps stay overnight in Grande Cache before or after their tour. This benefits other businesses in the town, as well as provides an opportunity to encourage visitors to participate in other activities in the area.

7.3. SCENARIO 3: LIMITED DEVELOPMENT ONSITE, CONTROLLED ACCESS ONLY TOURS PROVIDED BY LOCAL GRANDE CACHE GROUP

7.3.1. Type of Development

This scenario would be basically the same as Scenario 2, in terms of organization (creating a local Friends of the Dinosaur Tracks non-profit society) and controlled access for guided bus tours only, but with the addition of limited facility development and improvements onsite. In the longer term, any facility development or improvements would require an approval or disposition under the Public Lands Act from Alberta Sustainable Resource Development.

This scenario would include the following components:

- Access to the site would be by guided bus/van tours only (either operated by the society or on a contract basis). These tours would be provided on a regularly scheduled basis or as specially arranged tours, departing from the Visitor Information Centre using appropriately equipped small buses or vans (maximum 20 passenger capacity).

- Agreements or "consent" for vehicular access to the track sites will be required from the Alberta Sustainable Resource Development's local land manager, and/or the resource company or companies active in the area who may hold access roads under disposition. The Tourism Board, Friends of the Dinosaur Tracks, or local tour operator will not have control over access, simply because of the high costs associated with assuming responsibility for road maintenance and reclamation costs.

- Local tour guides would be trained and certified, and would accompany each tour bus. The guides would provide professionally developed interpretive information about the track sites and other related themes, developed by the local non-profit society. They would use reference materials to assist in describing the resource, as well as onsite signs and displays.

- The local non-profit society would coordinate development of improvements (possibly on a phased basis) at the site, thus allowing tour participants to get off the bus and safely view the track sites from viewpoints or walkways. These would include such improvements as:
  - Fencing around the track sites and viewing areas.
  - Pullouts, turnarounds and parking areas for buses at the different track sites.
  - Portable pump out toilets onsite.

- Signs and displays regarding the footprints and trackways, showing types of dinosaurs that made them, geological processes, etc.
- Elevated metal stairs/walkways for closer viewing of tracks, but outside the range of falling rocks.
- Telescopes and binoculars mounted on walkways or at viewpoints to assist in viewing the footprints and trackways.
- Small shelters/wind breaks.
- Lighting to improve daytime viewing.
- Develop/provide sound and light show or other evening programs.
- Possible helicopter landing pad if "higher end" helicopter tours to the track sites are considered in combination with other "flight seeing" options over area attractions.

- Tours of 4 – 5 hours in duration would operate from the Visitor Information Centre. Visitors taking the tour would be charged a fee calculated to cover operating expenses, liability insurance, amortized cost of site improvements, and provide a reasonable profit margin. Differential rates would be assigned for adults, children, families, groups and seniors. Tours might be a bit longer than in Scenario 2, since there will be better opportunities for guests to view the track sites from outside of the vehicle.

- The local non-profit society should consider some value added components to justify the cost of the tours, such as providing boxed lunches or other souvenir item. Lunches or snacks are particularly important if the tour is longer than 3 hours.

- Special events and programming can be developed both onsite and offsite. Examples of programs could include lighted evening viewing of the track sites, sound and light shows at the track sites (e.g., the Symphony of the Dinosaur Tracks), evening interpretive programs or talks offsite at the Visitor Centre, special study events, and so on.

- Control of tourism programming relative to the track sites remains local.

- Long term protection of the track sites through protective notation or historic resource designation is critical, and the Tourism Board and the Friends of the Dinosaur Tracks local non-profit society should actively pursue this and encourage designation to occur. They must also consult with specialists at Alberta Community Development relative to ensuring that any of the developments or improvements proposed do not impact negatively on the resource.

7.3.2. Implications for Tourism in Grande Cache

- The implications for tourism here will be very similar to those noted in Scenario 2. However, since there will be facilities, such as walkways and viewpoints at the site, it is likely that the guided tour may take longer, thus increasing the likelihood that participants will stay longer in town and spend money on meals, accommodation, shopping, or adventure activities.

- Opportunities also exist for developing special evening programs or other special programs onsite. This will lead to increased participation on the tours, and most likely require overnight stays and expenditures in town for those visitors participating in the evening programs.

- Development and programming initiatives at the track sites, Visitor Centre and in the Town of Grande Cache represent considerable investment in financial and human resources. This investment will contribute to developing the foundation of a sustainable tourism industry to help balance the often cyclical economy associated with resource extraction activities.

- This scenario is the preferred scenario, since it will maximize economic benefits to the community by providing locally controlled programming that will encourage longer stays and more expenditures in the area.

7.4. SCENARIO 4: POSSIBLE PUBLIC ACCESS (20 – 40 YEARS IN THE FUTURE)

7.4.1. Type of Development

This scenario is a long term one that is really not viable until all resource extractive activities in the area are completed. It is not possible in the short term due to reclamation activities and other resource uses being considered in the area.

However, if the situation changes and there are no longer resource extractive activities and commitments in the area, it may be possible that some roads in the area would be left open for public access. This would require a commitment by the local municipality or other body for road maintenance. This would be very costly, so a long-term plan regarding who would be responsible for funding and maintenance would be required.

If the area becomes accessible to the public by private motor vehicle, the need to ensure that the resource has been adequately protected is paramount. A surface disposition issued under the Public Lands Act to a local group could be put in place relative to protecting or displaying the track sites. While having public vehicular access to the site may reduce the saleability of any guided bus tours that have been developed, it may still be possible to limit, and charge for, access to the sites. Onsite guided tours or special interpretive programs/sound and light shows, could be provided for a fee. This would help to pay for any protective and interpretive measures, such as fencing, viewpoints or signs developed as part of Scenario 3.

7.4.2. Implications for Tourism in Grande Cache

- If the area is totally open for public access, then the business opportunity related to the provision of guided tours changes. It may still be possible to provide guided tours, but these may be only guided interpretive programs at the site rather than the half-day bus excursion from the Town of Grande Cache. Special programs, such as sound and light shows, may also still be viable options for encouraging visitation.

- While publicly accessible land in the area may encourage visitors to the area to stay longer, they may opt to camp in the backcountry rather than stay in commercial accommodation in the town. Other offsite programs, such as special programs offered at the Visitor Centre, may help to encourage visitor expenditures in the community.

- This scenario is not applicable at this time.

7.5. SCENARIO 5: VISITOR INFORMATION CENTRE ENHANCEMENTS

7.5.1. Type of Development

This scenario is applicable in all scenarios noted above. It provides for additional improvements and programming at the Visitor Centre and/or other locations in Grande Cache to support and complement the visitor experience related to the dinosaur track sites. Such improvements and programming are essential if the Visitor Centre is to serve the dual function of offsite reception and launch point for tours to the track sites, as well as interpretive centre for additional programming related to the tracks. It includes such components as:

- Modify existing as well as develop and add new displays/dioramas offsite at the Visitor Centre. This could include the preparation of additional casts and other new materials. It may be possible to obtain actual footprint specimens and casts collected by the Royal Tyrrell Museum of Palaeontology on a loan basis for display purposes.

- Develop exterior displays at the Visitor Centre relative to the track sites, using casts and other materials.

- Provide a staging area for bus tours and ticket sales for the guided tours.

- Provide special programs (day and evening). Some ideas for programs include:
  - Interpretive Programs in the daytime or evening that include talks or presentations on dinosaurs and other related themes, natural history, etc. This would provide an evening activity for visitors staying in the hotels or campground, and would likely be most effective during the summer months.
  - Guest lecture series (perhaps one per month), providing lectures on natural or regional history (footprints, nature hikes, etc).
  - Day camps for children/adults/special groups including such elements as: dinosaur theory and palaeogeography; a visit to the footprints; nature lessons and activities regarding plants, birds, and other animals; and practical exercises such as building bird feeders. These could be offered at the Visitor Centre, through such facilities as the Hide-A-Way Camp, or in conjunction with other programs (e.g., Elderhostel).

- Host symposiums to increase the visibility of track sites in the scientific community which will in turn boost awareness of the sites as a tourist attraction. Possible groups include:
  a) Local symposium (Alberta Palaeontological Society)
  b) National symposium (Canadian palaeontologists)
  c) International symposium (Vertebrate palaeontologists)

- Develop merchandise specific to the Grande Cache dinosaur tracks to sell in the gift shop, use in promotions, etc. This could include such things as: developing a field guide specifically related to the dinosaur footprints and geology of the Grande Cache area; creating postcards, slides, prints, posters or greeting cards featuring local photographers or artists renditions of the track sites; designing t-shirts or sweat shirts displaying dinosaur tracks and a catchy slogan; creating footprint casts or replicas and lapel pins; selling copies of interpretive materials developed for the track sites; developing videos or CDs that provide a virtual tour of the track sites; etc.

- Other related materials that could be sold through the gift shop include such things as: natural history, palaeontology and geology books; toy or inflatable dinosaurs; dinosaur jewelry; dinosaur models; and so on.

7.5.2. Implications for Tourism in Grande Cache

- Modifications to the displays and exhibits at the Visitor Centre will be beneficial in any of the scenarios noted above. By providing additional casts of footprints and other displays, as well as exterior displays that add a new dimension to the experience, it may be possible to encourage visitors to spend a few extra hours in the town and area. The addition of day and evening interpretive programs, for which entrance fees can be charged and refreshments sold, will add revenue streams to the operation. Specialized merchandise developed to sell in the gift shop, as well as through other local businesses, will add another source of revenue.

- Depending on how the local group/society formed to manage the program is structured, the Visitor Centre could be set up to provide office space and support for it. If this were the case, then interpretive materials developed by the non-profit society could be provided by the centre on a sale basis. In addition, the guide training and certification program can be operated through the Visitor Centre.

- This common scenario should be pursued regardless of which of the previous scenarios are adopted.

8. CONCLUSIONS AND RECOMMENDATIONS

8.1. CONCLUSIONS

This Tourism Opportunity Analysis has reviewed several factors in the context of determining the capacity of the dinosaur footprints and trackways in the Grande Cache area to be developed as marketable tourism products. To summarize, the key findings are as follows:

- The dinosaur footprints and trackways are scientifically significant in a North American and international context (See Sections 6.2. – 6.3.)

- The track sites and the surrounding Grande Cache area meet most of the criteria identified in terms of tourism significance, including uniqueness, opportunities for interpretive programming, availability of other tourism attractions and services, local interest, success of other similar types of attractions elsewhere, and potential linkages with other related attractions in other areas. (See Sections 6.4. – 6.5.)

- The track sites are located on Provincial Crown land zoned as "multiple use" in an area that was formerly part of an active coal mining operation. The area around the track sites is currently being reclaimed, and there are applications for additional resource extractive activities to occur in the surrounding area. A protective notation placed on the area in the short term by Alberta Community Development, followed by designation as a Provincial Historic Resource (PHR), is critical in terms of effectively protecting the track sites for future visitor use and enjoyment. (See Section 3.3.3.). In addition, controlling access to the site will help to protect the resource from vandalism. (See Section 5.2.1.)

- Once coal mining operations begin again in the area, there will be loaded mining trucks using the same roads that the dinosaur tracks tour vehicles would be using. Numbers of haul trucks may vary, depending on the location. One estimate relative to the possible opening up of the 16 Mine site suggested there could be one loaded haul truck passing the W3 dinosaur track sites every 15 minutes. This would create dust and noise, as well as make it critical for the tour vehicle to be well off the road and not blocking the run away lanes. In order for both mining and tourism operations to safely co-exist, it will be essential to negotiate agreements in terms of how tour vehicles will operate within the active mining area. This could include following agreed upon schedules and routes, using radios to control where and when tour vehicles should proceed, using pilot vehicles with mine staff to guide the tour vehicle through the area, and so on. In addition, protective clothing (e.g., boots, coveralls and hard hats) may be necessary for visitors.

- Safe, reliable and affordable access to the resource is critical (e.g., minimizing impacts of mining vehicles and providing pull outs). Vehicular access to the track sites is possible along roads that were developed as coal haul roads. These haul roads are currently the responsibility of the Alberta government, with the Smoky River Haul Road being open to the public at their own risk as far as the haul roads leading to Mines 9 and 12, the area of the most significant track sites. These two mine roads are currently gated and locked as a result of reclamation activity in the area. Once the various applications for coal mining and other resource uses are resolved over the next year or two, road maintenance will become the responsibility of one or more resource companies, although some roads may remain under provincial responsibility where reclamation is the only approved road use. When that occurs, it should be possible to negotiate a "consent' agreement with the resource company or companies relative to using the road on a controlled basis for bus tours to access the sites. Because of the high maintenance and reclamation costs associated with being the "first-in" to lease an area requiring road access, it is cost prohibitive for a tourism operation to take on this responsibility. (See Section 3.3.4.)

- Access to the track sites in the interim period until the various coal and other resource applications have been resolved (up to 36 months) will be by short-term approval from the land manager and/or resource companies, as appropriate. (See Section 3.3.4.)

- The interchange at Highway 40 and the Smoky River haul road does not meet Alberta Transportation standards for use by commercial buses or vans. Weyerhaeuser plans to construct a new interchange 2 km north of the current one in the fall of 2001 that would be safe for all tourist traffic, including motor coaches. Until this access is completed and "consent" agreements are in place, access to the track sites for the summer of 2001 would be via the Highway 40 overpass and local roads located inside the ATCO Power Plant site. Alberta Transportation advises that buses or vans carrying up to 20 passengers should be acceptable. Access through this site would require approvals from both ATCO and the Province. Both have expressed support in principle, provided liability and indemnity conditions are met. (See Section 3.3.4.)

- A Miscellaneous Lease or other appropriate disposition is required for development of site improvements in addition to fencing, such as viewing platforms, signs and displays, to help protect the resource, to allow better views of the track sites, and to provide a better visitor experience. This can only be acquired once access considerations are resolved. Application should be made through the ATRL process. (See Section 3.3.2.)

- Any tourism operation must co-exist with other resource activities. Representatives of companies currently interested in resource uses in the area have shown a willingness to work cooperatively with the town or non-profit society seeking to develop tours to the dinosaur track sites. In addition, the provincial government land managers have been positive and supportive in their response to the concept. (See Section 3).

- Assured public safety and associated liability protection is essential. Liability and indemnity concerns from the Province, other industrial land users, and insurers of tourism operations, mean that any tourism operation must carry sufficient insurance. This may range from a minimum standard liability two to six million dollars or more, as is the case with commercial lessees and tourist attraction operators within Canada's national parks. As an example, the T-Rex Discovery Centre in Saskatchewan carries a minimum of five million dollars in third party liability insurance. (See Section 3.3.5.)

- Review of implications for tourism in Grande Cache resulting from development of tourism programming at the track sites suggests that Scenarios 2 (Controlled Access with No Development) or 3 (Controlled Access with Limited Development) are the most beneficial, with Scenario 3 being the one most likely to have the greatest positive impact on the community. In addition, Scenario 5 concerning additional development and use of the Visitor Centre is an important component. (See Section 7)

- A non-profit society, such as the "Friends of the Dinosaur Tracks Society", should be formed locally to take the lead role in developing and managing the tourism product and programming. This would ensure that operation of the tourism business related to the dinosaur tracks remains a local undertaking, keeping the benefits in the community. A non-profit society, possibly providing services through contracted operators, will provide an entity for such things as: applying for land dispositions and access agreements; fund raising and grant applications; volunteer participation; etc. (See Section 3.3.2.)

- Community involvement in planning for and developing the tourism attraction is very important in helping to build a sense of "ownership" and local understanding of the significance of the resource and the benefits that will result from both protecting it and developing tourism programming to provide a high quality visitor experience. Some sites contacted noted that community involvement was important in obtaining approvals, fund raising, as well as in participation of local volunteer groups in some aspects of development, such as trail building. (See Appendix B: Best Practices Matrix)

- Advice from other similar types of attractions is that development of a tourism program should begin on a small scale and should ensure that adequate measures are in place to protect the resources for future enjoyment and use. (See Section 5.1 and 5.2)

- Development of a tourism product such as this will require the long term commitment of a number of individuals who are prepared to provide time and energy over several years to help make this a sustainable, thriving business. As noted in the Implementation Strategy in Section 9.2., a lot of steps are required before the first season of operation can begin. Much of this will require volunteer time and effort. It should be noted that it is unlikely any regularly scheduled tours will be sold out in the first year or two of operation. Other sites indicated that it took a couple of years of operating at around 40% capacity before their product became known enough to attract larger numbers. (See Section 4.1.2.)

- Tourism visitation in the region is primarily during the summer (mid June to mid September), with increasing use during the spring and fall "shoulder" seasons (May to June and September to October). Much of the tourist traffic relates to Alaska Highway traffic and adventure activities. This, in combination with snow and adverse weather conditions during the winter, means that regularly scheduled guided tours to the track sites would be primarily a summer attraction, although some scheduled tours may be possible in the shoulder months. Most shoulder season activity would be by special arrangement with tour groups from outside the area. (See Sections 2.4 and 4.1.)

- Comparison with other similar types of attractions suggests that the type of tourism attraction to be developed in Grande Cache will not likely attract huge volumes of visitors, as may be expected at museums or other facilities with displays of dinosaur specimens and more accessible locations. Rather, if access to the track sites is by guided tour only, the numbers that can visit the site will be limited.

- This means that the number of visitors Grande Cache should expect to attract will be similar to the numbers attracted by other sites that are in somewhat remote locations, where there is a requirement to pay for a guided tour to see the resource, and where there is a limited number of spots available for the tours. As a result, sites like the Yoho Burgess Shales, Devil's Coulee Dinosaur Heritage Museum and Tours, and the T-Rex Discovery Centre, with visitation in 2000 ranging from 1,275 visitors to 7,000 or more, offer an indication of the numbers of visitors that might be expected as the attraction develops. (See Section 4.1.2.)

- If guided tours to the track sites using a 20 passenger vehicle are developed and operated once a day for the summer season (June 15 to September 15), the maximum number of visitors participating on the tours would be about 1860 visitors. In the first year or two of operation, it is unlikely that tours would operate at full capacity or every day, although it might be possible to operate two tours per day at peak times. Comments from other similar sites noted that their tours operated at an estimated 40% capacity for the first couple of years of operation. Hence, the more realistic expectation for numbers of visitors in the first few years of operation in Grande Cache may be around 750 – 1000 participants. Other sites have also implemented advance booking policies for tours, with payment at time of booking, change fees of $20, and fees being non-refundable. This helps in planning and managing operations.

8.2. RECOMMENDATIONS

Based on the above assessment and conclusions, it is recommended that:

- Scenario 3 (Controlled Access with Limited Development), along with Scenario 5 (Visitor Information Centre Enhancements), be adopted as the preferred scenarios for tourism programming related to the track sites. That said, the first couple of years of operation may not involve development at the site, and the requirements noted as part of Scenario 2 would apply. Scenarios 1 and 4 are not recommended for consideration.

- Types of tourism product and programming that should be considered for the first few years of operation include:
    - Half day (3 to 4 hour) bus/van tours (20 passengers) departing once or twice a day from the Visitor Centre, led by trained and certified guides who deliver a professionally designed interpretive program. Tours would cost a minimum of $25 to $30 per person, and likely more (e.g., Burgess Shale charges $45/adult and $25/child for guided hikes that do not include bus transportation costs).
    - Special afternoon and/or evening interpretive programs (including slide shows and other activities) delivered at the Visitor Information Centre. Entrance fees of $5 to $10 could be charged and refreshments could be sold.
    - Special day camp type programs for children or special groups, including a site visit and other activities. Costs would be similar to the tours noted above.
    - Special evening visits under the lights or for sound and light shows onsite at the track sites on a scheduled basis, similar in cost to the tours noted above.
    - Modification and expansion of the displays at the Visitor Centre and development of outside displays to enhance the visitor experience.
    - Merchandise specific to the track sites developed for sale at the Visitor Centre, such as posters, prints, cards, virtual CD/video tours, guidebooks, and T-shirts.

- The Grande Cache Tourism Board immediately take steps to form a non-profit " Friends of the Dinosaur Tracks Society" to take the lead in developing and managing the product.

- The Grande Cache Tourism Board and/or Friends of the Dinosaur Tracks Society seek immediate sources of funding, such as donations from corporate sponsors, to assist in launching a pilot test of the guided tours in the summer of 2001.

- The Grande Cache Tourism Board establish an advisory body to provide advice to the Society regarding planning and development of the track sites. This could include representatives from the Town of Grande Cache, the Royal Tyrrell Museum of Palaeontology, Alberta Sustainable Resource Development (as the local land manager), Alberta Economic Development, companies such as Grande Cache Coal Company Inc, and perhaps the Grande Prairie Museum to reflect regional linkages.

- The Tourism Board and the new Society actively pursue designation of the track sites as a Designated Historic Resource, and work with Alberta Community Development to determine what are the appropriate types of development and improvements that will not damage or negatively impact on the resource.

- The new Society seek the services of an operator to provide 20 passenger bus/van service to the track sites so that the product can be tested in the summer of 2001 on a limited basis. Liability insurance requirements would be negotiated in this arrangement.

- The new Society seek temporary authority from the local land manager, Alberta Transportation and ATCO relative to operating a limited number of controlled access tours to the track sites at Mines 9 and 12, using the Highway 40 overpass and access through the ATCO site, as part of a pilot test in 2001. In the longer term, it will be necessary to arrange "consent" agreements with whichever resource companies obtain dispositions regarding maintenance of the roads.

- The new Society initiate development of an interpretive plan that will provide basic materials for use on guided tours operated on a pilot basis during the summer of 2001. This would best be done with the assistance of a qualified interpretive planning consultant. This should include the creation of scripts that can be used by a guide or guides who would be contracted (or hired) and trained to deliver an interpretive program as part of the guided tours, as well as reference materials and albums that can be used to demonstrate such things as types of dinosaurs that formed the tracks, etc. In the longer term, additional interpretive themes and materials will need to be developed, along with designs for signs and displays to be erected both at onsite and offsite locations.

- The new Society must develop business and operational plans, including the pilot test phase in 2001 and proposed developments, enhancements, and operations in future years. These plans should be reviewed and revised on an annual basis.

- The Society hold initial discussions with the local land manager in Alberta Sustainable Resource Development to ensure he is aware of their interest in applying for a tourism disposition for the track sites. They should then submit a letter of intent to the land manager as soon as possible, requesting that a Consultative Notation (CNT) be put on the sites that will reflect that an application is pending relative to obtaining a long-term disposition on the track sites. This would prevent a third party from outside of the Grande Cache area from securing a preferred position.

- The Society develop the necessary materials relative to applying through the Alberta Tourism Recreational Leasing (ATRL) process for a disposition on the track sites, submitting this when the time is appropriate (likely within 1 – 3 years).

- The new Society develop an initial communications, marketing and promotions strategy that will guide communications and promotions during the first few months of the project. This would include such activities as a news release and media launch of the product; inviting media to experience the product; maintaining membership in the Great Canadian Fossil Trail Club and sharing information with other members of the Club about the product; preparing posters/fliers to post in the Visitor Centres in Grande Cache and elsewhere, as well as in hotels, campgrounds, other attractions like the Grande Prairie Museum and at special events, such as the Death Race; and providing regular updates to the community and local media.

- Following the initial season of operation and review of results, longer-term communications and marketing plans (3 to 5 year term) should be developed and implemented. Longer term efforts should focus on encouraging other tour operators to include a visit to Grande Cache and the dinosaur tracks as part of their tour programs, either as a main focus or as an add-on to an existing program.

- Once the Society is established, they should identify ideas for, and pursue, fund raising and other sources of funding for which they may be eligible.

- Work with Provincial Government Departments and resource companies active in the area relative to developing additional roadside interpretation signs and facilities (caribou, lichen forests, mining, recreation) to enhance the overall visitor experience.

9. IMPLEMENTATION STRATEGY

Five scenarios for implementation were presented in Section 7, including four relative to onsite access to the track sites and one overall scenario related to the Grande Cache Visitor Centre.

The recommended scenarios for implementation are Option 3: Limited Development Onsite, Controlled Access Only by Local Grande Cache Group, along with Scenario 5: Visitor Centre Enhancements.

The following Table 11 presents an implementation strategy that should be considered in developing Scenarios 3 and 5. It should be noted that the implementation steps required in the first couple of years of Scenario 3 are almost identical to those that would be required if Scenario 2: No Development Onsite, Controlled Access Only by Local Grande Cache Group was selected.

Implementation strategies have not been provided for either Scenario 1: Maintain the Status Quo, No Development Onsite or Scenario 4: Long Possible Public Access. Neither of these are recommended scenarios.

TABLE 11: IMPLEMENTATION STRATEGY

SCENARIO 3: LIMITED DEVELOPMENT ONSITE, CONTROLLED ACCESS ONLY TOURS PROVIDED BY LOCAL GRANDE CACHE GROUP

ASSUMPTIONS:

- Assumes pilot test of guided bus tour initiated for summer of 2001 with temporary access authority and no dispositions on the sites for the first year or two of operation, but that these will be in place by year 3 or 4.
- Assumes there will be no development on site for the first couple of years until other resource applications have been resolved and opportunities for access have been determined. As such, the actions noted below are very similar to those that that would be required for Scenario 2: No development on site and controlled access only.
- Assumes Tourism Board and interested parties in the community establish a non-profit Friends of the Dinosaur Tracks Society with a management board/executive that will develop and operate the guided bus tours and other programming, most likely contracting with a local operator to provide the bus/van service to the site.
- Assumes that initial funding support may be obtained from West Yellowhead Community Futures Development Corporation and possibly from other corporate partners to help the Society begin operation of a one-year pilot of the tours immediately. This will require some funding for a full or part-time paid staff person to assist the Society. It is also assumed that the Society will initiate fund raising projects and receive licence revenue from operation of the bus tours, sale of merchandise, etc.
- Assumes support from the Town of Grande Cache and that Alberta Economic Development (AED) and other agencies will provide advice and support to the initiative, including possible participation on an Advisory Board.

I - SHORT TERM: Within 6 MONTHS – 1 YEAR (April 2001 to December 2001)

ACTIONS REQUIRED	WHO RESPONSIBLE	WHEN/ TIMELINE	ORDER OF MAGNITUDE COSTS
I.1. Share results of study with Community and make decisions regarding whether or not they will pursue tourism programming and development.			
I.1.1. Public Meeting to share results of study • Determine level of support • Identify individuals interested in being involved	AED with Tourism Board	June 2001	$2,500 – 3,000 plus room rental, coffee, and volunteer time

ACTIONS REQUIRED	WHO RESPONSIBLE	WHEN/ TIMELINE	ORDER OF MAGNITUDE COSTS
I.1.2. One half to one day working session in community to review the detailed implementation plan and • Arrange session and invite participants • Convene/facilitate workshop to develop more detailed action plan • Establish a Dinosaur Tracks Committee and assign responsibilities for follow up actions to keep the project moving forward until a more formalized organization (e.g., non-profit society) is in place	Tourism Board with AED	June 2001	$2,500 – 3,000 plus room rental, coffee, lunch and volunteer time
I.2. Establish an Advisory Body relative to planning and development of the track sites and to provide advice to the Society when it is formed			
I.2.1. Identify representatives from key groups to participate in an advisory capacity relative to planning and developing the track sites and tours (e.g. Town, Tyrrell Museum, local land manager, resource companies, AED, Grande Prairie Museum).	Tourism Board with AED support	June 2001	Participation by agencies
I.2.2. Identify the requirements for a cooperative program that will assess safety issues at the key dinosaur track sites and advise on/establish process to obtain information. Results from assessment to be input into business and operational plans in I.5. May require commitment of time/resources from participant agencies.	Advisory Body	June/July 2001	Participation by agencies for monitoring, assessment
I.3. Establish Non-Profit Organization (Friends of the Dinosaur Tracks Society) to coordinate/manage the dinosaur tracks tour program			
I.3.1. Identify specific requirements for establishing a non-profit Friends Society by reviewing the requirements of the Alberta Societies Act and Regulations, administered by Corporate Registry of Alberta Government Services (http://www3.gov.ab.ca/gs/information/clctc/incorporating_societies.cfm), and by contacting individuals in other Friends organizations (e.g., Friends of Jasper or Banff National Park).	Delegated member Dinosaur Tracks Committee	June 2001	2–3 hours of volunteer time
I.3.2. Convene a meeting(s) of persons interested in establishing a non-profit society immediately to develop objectives, draft by-laws, select directors, identify staff requirements, establish membership fees. Assistance may be available from Community Development Officers of Alberta Community Development as facilitators or resource experts.	Dinosaur Tracks Committee	June 2001	Volunteer time to notify people and participate, room rental/coffee costs;
I.3.3. Complete and submit application form for incorporating as a society	Delegated member of Dinosaur Tracks Committee	June/July 2001	Fees for incorporation (legal and registry)

ACTIONS REQUIRED	WHO RESPONSIBLE	WHEN/ TIMELINE	ORDER OF MAGNITUDE COSTS
I.3.4. Seek funding support from the West Yellowhead Community Futures Development Corporation and possible other corporate partners for initial start up costs and operations, including developing initial interpretive materials for guided tours and to assist in hiring a paid employee for the Society	Tourism Board, Dinosaur Tracks Committee, and Society when formed	June 2001 and ongoing	Volunteer time
I.3.5. Initiate membership drive through local media, visitors to Visitor Centre, other groups such as Alberta Palaeontological Society	Dinosaur Tracks Society	July 2001 and ongoing	Volunteer time, letters and postage
I.3.6. Develop fund raising strategy and program (e.g., Identify fund raising ideas for Society, such as a raffle, and initiate)	Dinosaur Tracks Society Board	Oct/Nov 2001 and ongoing	Board and volunteer time
I.4. Support efforts of Alberta Community Development to place a protective notation on the track sites in the short term and consideration of Designated Historic Resource status.			
I.4.1. Submit letter of support to Alberta Community Development regarding designation of the track sites as a Provincial Historic Resource,	Delegated member of Tourism Board,	June 2001	Volunteer time
I.4.2. Solicit letters of support for designation from companies active in the area (e.g., Weyerhaeuser, Grande Cache Coal, D & R Resources)	Dinosaur Tracks Committee/Society	Summer 2001 and ongoing	Volunteer time
I.4.3. Tourism Board and Society Board participate in any stakeholder discussions convened by Alberta Community Development relative to designation	Tourism Board, Dinosaur Tracks Committee/Society	Fall 2001 and ongoing	Volunteer time
I.4.4. Meet with representatives of Alberta Community Development relative to operational plans and to identify resource management programs requirements; encourage these meetings to occur in Grande Cache	Dinosaur Tracks Committee/ Society	June 2001 and ongoing	Volunteer time, Travel costs minimal if meetings in GC
I.5. Develop interim business and operations plans			
I.5.1. Hire a consultant/approach West Yellowhead Community Futures Development Corporation to assist local group in developing business and operational plans, and in getting pilot test in place for first year (would involve about 8 - 10 days to facilitate points in 5.1 – 5.5.)	Dinosaur Tracks Committee/ Society Board	June-Dec 2001	Assistance from Community Futures or Consulting fees and expenses $9,000 - $10,000
I.5.2. Identify business objectives, budgets, operations plan and targets. Also determine arrangements with Visitor Centre relative to operating as base for tours, selling tickets, etc.	Dinosaur Tracks Committee/ Society Board	June 2001	Consultant/ Community Futures as part of 5.1; volunteer time
I.5.3. Determine fees for guided bus tours, recognizing product not fully developed and in pilot phase	Dinosaur Tracks Committee/ Society Board	June 2001	Consultant/ Community Futures as part of 5.1; volunteer time

ACTIONS REQUIRED	WHO RESPONSIBLE	WHEN/ TIMELINE	ORDER OF MAGNITUDE COSTS
I.5.4. Develop comment cards for distribution to participants on tours seeking input regarding improvements required	Designated member of Dinosaur Tracks Committee/ Society	July 2001	Consultant as part of 5.1; volunteer time
I.5.5. Review plan after pilot period and revise for following year, developing longer term 3 to 5 year plan as well. Consider ways of supporting scientific research (e.g., through a portion of revenues), and determine if protective clothing (coveralls, boots) are required for visitors or if pull offs/turnaround areas are required for 2002 operation.	Dinosaur Tracks Committee/ Society Board	Sept-Dec 2001	Consultant as part of 5.1; volunteer time
I.6. Make arrangements/negotiate contract with local operator relative to providing bus/van service for guided tours			
I.6.1. Identify bus/van and liability insurance and indemnity requirements and negotiate with possible local operators.	Designated member of Dinosaur Tracks Committee / Society	June 2001	Paid staff or volunteer
I.6.2. Review how operation went; determine changes required; provide feedback into business and operational plans. Arrange a third party audit.	Dinosaur Tracks Committee /Society	Sept/Oct 2001	Paid staff or volunteer, Board review, cost of audit
I.6.3. Determine arrangements for summer 2002 and whether or not should consider purchasing vehicle.	Dinosaur Tracks Committee / Society	Nov/Dec 2001	Paid staff or volunteer
I.7. Apply to local land manager at Alberta Sustainable Resource Development for a letter of authority to operate guided tours on specified dates during the July, August and early September 2001			
I.7.1. Identify dates/period for scheduled guided tours; draft letter requesting letter of authority to access sites, identifying dates, size and type of vehicle, proposed routing, etc; based on outcome of business and operational planning	Delegated member of Dinosaur Tracks Committee/ Society	June 2001	Paid staff or volunteer
I.7.2. Meet with local land manager to discuss proposed operation, liability considerations and future action required for access and lease application through ATRL	Delegated member of Dinosaur Tracks Committee / Society	June 2001	Paid staff or volunteer
1.8. Apply to Alberta Transportation and ATCO relative to use of overpass for access to track sites in summer 2001			
1.8.1. Contact Alberta Transportation to confirm their approval for use of the Highway 40 overpass	Designated member of Committee/ Society	June 2001	Paid staff or volunteer
1.8.2. Draft and submit a letter of application demonstrating approval from affected provincial agencies to: The Station Manager, ATCO Power, Postal Bag 7000, Grande Cache, AB. T0E 0Y0.	Designated member of Dinosaur Tracks Committee/ Society	June 2001	Paid staff or volunteer

ACTIONS REQUIRED	WHO RESPONSIBLE	WHEN/ TIMELINE	ORDER OF MAGNITUDE COSTS
I.9. Develop Interpretive Plan and initial programming, including scripts for guides and presentation materials			
I.9.1. Hire an interpretive consultant and a specialist in palaeontology to assist local group in developing the interpretive plan and a professional program for the initial year. Includes identifying themes, content, story lines, scripts for use in the first year of the program, reference binder for use on the bus. Draw on expertise and assistance of Tyrrell Museum staff, encouraging them to attend meetings in Grande Cache; require 8 – 9 days of time. Seek funding support through corporate sponsors/partners.	Dinosaur Tracks Committee /Society	June 2001	Consulting fees and expenses of $6,000 – $7,000; volunteer time
I.9.2. Develop training program for local guides, including content for tours as well as other customer relations training; Have interpretive consultant assist in developing/delivering training program (4 – 5 days for initial training, monitoring over summer, evaluating and modifying)	Dinosaur Tracks Committee /Society	June/July 2001	Consulting fees and expenses $2,500 - $3000; volunteer time
I.9.3. Contract with existing local operator(s) or hire a student to deliver guided program on the tours	Dinosaur Tracks Committee /Society	June/July 2001	Contract/salary for student/ guide
I.9.4. Have interpretive consultant assist local group in determining content/design of handout brochure for visitors participating on tour and for sale in gift shop and produce copies, as well as for marketing brochures (2 – 3 days)	Dinosaur Tracks Committee / Society	July/August 2001	Consulting fees and expenses $2,000 - $2,500, plus printing
I.9.5.Have interpretive consultant assist in modifying materials from summer program (including review of comments received through cards circulated as part of step I.5.4) and develop additional themes and story lines to finalize interpretive plan (8 - 10 days). Also consider modifications to exhibits in VIC.	Dinosaur Tracks Society with interpretive consultant, Tyrrell Museum staff	Oct-Dec 2001	Consulting fees and expenses $6,000 - $7,000; volunteer time
I.10. Develop interim communications, marketing and promotions plan			
I.10.1. Identify interim communications and promotional strategy for first summer of operation, recognizing the key period for marketing has been missed; Assistance may be available through Parcom/Travel Alberta and from consultant assisting in developing business and operations plans (step I.5.1)	Dinosaur Tracks Committee /Society	June 2001	Board, Volunteer time
I.10.2. Implement communications and promotional activities, such as organizing a launch of the product, news releases, inviting media to launch, posting information in the Visitor Centres in Grande Cache and elsewhere such as the Grande Prairie Museum, placing notices in local hotels and campgrounds	Designated members of Dinosaur Tracks Committee /Society	June-Sept 2001	Paid staff/ volunteer, copies and postage to distribute, hosting launch
I.10.3. Maintain membership in Great Canadian Fossil Trail Product Club and participate in developing guidebooks, website and marketing initiatives with them. Share information about pilot tours with other member sites.	Designated member of Dinosaur Tracks Committee /Society	July 2001 and ongoing	Membership $100/ year. Send copies of information sheet to other sites to display
I.10.4. Provide report back to community relative to success of summer operation.	Dinosaur Tracks Society	Sept/Oct 2001	Paid staff

ACTIONS REQUIRED	WHO RESPONSIBLE	WHEN/ TIMELINE	ORDER OF MAGNITUDE COSTS
I.11. Develop Longer Term Communications and Marketing and Promotions Plans			
I.11.1. Develop 3 to 5 year Communications Strategy and Marketing and Promotions Plan, including defining objectives, target markets, tactics, role as receptive operator, marketplaces to attend, etc. Assistance may be available through Parcom/Travel Alberta. May also need input from creative consultant relative to developing an image for marketing, merchandise and linked to the interpretive story line.	Designated members of Dinosaur Tracks Society Board	Oct-Dec 2001	Board time, paid staff, marketing consultant (perhaps through Travel Alberta), image consultant $3,000
I.11.2. Begin to implement marketing plan initiatives as appropriate, using partnerships with other operators wherever possible; may include production of brochure	Designated members of Dinosaur Tracks Society	December 2001 and ongoing	Paid staff, partners, volunteer time, budget to be determined by plan
I.12. Develop merchandise specific to dinosaur tracks			
I.12.1. Discuss ideas for merchandise with local artists and craftspeople and encourage development	Designated members of Dinosaur Tracks Society	Ongoing	Paid staff, volunteer time
I.12.2. Identify any specific ideas that are unique to Grande Cache and consider licencing these and developing a trademark logo that may be sold to third parties for use outside Grande Cache. This leads toward an identity package for use in marketing and promotions. Seek support from an outside consultant in terms of image and registering trademark (see 1.9.1.)	Designated members of Dinosaur Tracks Society Board	October 2001 and ongoing	Board time, paid staff, image consultant (as in 1.9.1)

II – MEDIUM TERM: 1 – 2 YEARS (January 2002 to December 2003)

ACTIONS REQUIRED	WHO RESPONSIBLE	WHEN/ TIMELINE	ORDER OF MAGNITUDE COSTS
II.1. Apply to local land manager at Alberta Sustainable Resource Development for a letter of authority to operate guided tours on specified dates during the 2002 summer season			
II.1.1. Identify dates for providing guided tours; draft letter requesting letter of authority to access sites, identifying dates, size and type of vehicle, proposed routing, etc	Designated member of Dinosaur Tracks Society	Feb/March 2002	Volunteer time, result from business & operations plan
II.1.2. Meet with local land manager to discuss proposed operation, liability considerations and monitor status of resource extractive applications relative to when to apply for lease through ATRL	Designated member of Dinosaur Tracks Society	April 2002 and ongoing	Volunteer time
II.2. Hire guides and coordinate training program			
II.2.1. Determine number of guides required based on number of tours proposed to operate and seek funding from summer student employment programs to hire guides for summer season 2002	Designated member of Dinosaur Tracks Society Board	Feb/March 2002 and annually thereafter	Paid staff, Board volunteer time
II.2.2. Advertise for and select guides for summer operation	Designated member of Dinosaur Tracks Society Board	April/May 2002 and annually thereafter	Paid staff, volunteer time
II.2.3. Deliver training program for guides using interpretive consultant; develop expertise in community to deliver training program in future (e.g., Train the Trainer)	Designated member of Dinosaur Tracks Society Board	May/June 2002 and annually thereafter	Paid staff, volunteer time, consulting fees & expenses ($2,000 - $2.500)
II.2.4. Evaluate program through comment cards, observation and modify as required; assistance from interpretive consultant	Designated member of Dinosaur Tracks Society Board	July-Sept 2002 and annually thereafter	Paid staff, Board, consulting fees and expenses ($1,500)
II.3. Friends of the Dinosaur Tracks Society			
II.3.1. Continue fund raising, coordinating planning for summer 2002, review of business and operational plans, review of merchandise, consideration of special events, etc.	Designated members of Dinosaur Tracks Society	Ongoing	Paid staff, volunteer time
II.3.2. Convene annual meeting	Dinosaur Tracks Society	May/June 2002	Paid staff, volunteer time

ACTIONS REQUIRED	WHO RESPONSIBLE	WHEN/ TIMELINE	ORDER OF MAGNITUDE COSTS
II.4. Review business plan and Prepare Capital Development and operational plan			
II.4.1.Review business and operational plans to determine if any changes after summer operation. Consider assistance of consultant to facilitate review.	Dinosaur Tracks Society Board	Sept/Oct 2002	Board time, Paid staff, consulting fees & expenses ($1,500 - $2,000)
II.4.2. Prepare capital development plan relative to improvements required onsite; consider phased development; consult with Community Development and provincial land managers. Seek services of professional consultant in terms of engineering tests, design and construction requirements to determine detailed costs and timelines.	Dinosaur Tracks Society Board	Oct-Dec 2002	Board time, paid staff, consulting fees and expenses ($10,000 - $25,000)
II.5. Negotiate access arrangements with Resource Companies responsible for road access			
II.5.1. Maintain contact with resource companies seeking resource extraction permits in area and negotiate "consent" agreement(s) relative to access when dispositions determined	Designated member of Dinosaur Tracks Society	Jan 2002 or when appropriate, ongoing	Paid staff, volunteer time
II.6. Apply for land disposition for track sites			
II.6.1. Prepare application for land disposition based on ATRL process and submit when decisions have been made on other resource uses in area; consult with local land manager	Designated member of Dinosaur Tracks Society	Jan-Mar 2003	Paid staff, volunteer time
II.7. Obtain Development Permit from Municipal District			
II.7.1. Discuss proposed development with Municipality to determine detailed requirements for development permit and apply as appropriate	Designated member of Dinosaur Tracks Society	Jan-Mar 2003	Paid staff, volunteer time
II.8. Review bus/van arrangements with local operator and finalize for future year			
II.8.1. Review how operation went; determine changes required; provide feedback into business and operational plans	Designated member of Dinosaur Tracks Society	Sept/Oct 2002 and annually	Paid staff, volunteer time
II.8.2. Determine contractual arrangements for summer 2003	Designated member of Dinosaur Tracks Society	Oct/Nov 2002 and annually thereafter	Paid staff, volunteer time

ACTIONS REQUIRED	WHO RESPONSIBLE	WHEN/ TIMELINE	ORDER OF MAGNITUDE COSTS
II.9. Communications Strategy and Marketing and Promotions Plan Review/Update			
II.9.1. Annual review of communications strategy and marketing/promotions plan, reviewing objectives, target markets, tactics, etc.; Assistance may be available through Parcom/Travel Alberta	Dinosaur Tracks Society Board	Oct-Dec each year	Paid staff, board and volunteer time
II.9.2. Implement marketing plan initiatives as appropriate, using partnerships with other operators wherever possible; may include production of brochure	Designated members of Dinosaur Tracks Society, partners	Ongoing	Volunteer time, budget to be determined by plan;

III - LONG TERM: 3 - 5 YEARS (January 2004 to December 2006)

ACTIONS REQUIRED	WHO RESPONSIBLE	WHEN/ TIMELINE	ORDER OF MAGNITUDE COSTS
III.1. Review business plan and implement capital development plan			
III.1.1.Annually review business and operational plans to determine if any changes after summer operation	Dinosaur Tracks Society Board	Sept/Oct each year	Paid staff, volunteer time
III.1.2. Begin to implement capital development plan relative to improvements required onsite; consider phased development; ongoing consultation with Community Development and provincial land managers. May include things like fencing, lights, walkways, viewing platforms, telescopes, toilets, wind shelters, etc	Designated member of Dinosaur Tracks Society Board	May/June 2004 and ongoing	Costs to be determined based on what elements included
III.2. Ensure "Consent" Agreements for Access in place			
III.2.1.Maintain contact with resource companies operating in area relative to ensuring access "consent" agreements in place and ensuring there are no problems with operations	Designated member of Dinosaur Tracks Society	Ongoing	Paid staff, volunteer time
III.3. Dinosaur Tracks Society			
III.3.1. Convene annual meetings, arrange other communications as required by by-law	Dinosaur Tracks Society Board	Ongoing	Paid staff, volunteer time
III.3.2. Coordinate fund raising events and activities to raise funds for onsite development and improvements at the Visitor Centre	Designated member of Society	Ongoing	Paid staff, volunteer time
III.3.3. Seek funding from other sources, including grants, partnerships, sponsors, etc.	Designated member of Society	Ongoing	Paid staff, volunteer time

ACTIONS REQUIRED	WHO RESPONSIBLE	WHEN/ TIMELINE	ORDER OF MAGNITUDE COSTS
III.4. Hire guides and coordinate training program			
III.4.1. Determine number of guides required based on number of tours proposed to operate and seek funding from summer student employment programs to hire guides for summer season 2002	Designated member of Dinosaur Tracks Society	Feb/March each year	Paid staff, board time
III.4.2. Advertise for and select guides for summer operation	Designated member of Society Board	April/May each year	Paid staff, volunteer time
III.4.3. Deliver training program for guides using local expertise	Designated member of Society Board	May/June each year	Paid staff, volunteer time or certified local operator
III.4.4. Evaluate program through comment cards, observation and modify as required	Designated member of Society	July-Sept each year	Paid staff, volunteer time
III.5. Communications Strategy and Marketing and Promotions Plan Review/Update			
III.5.1. Annual review of communications strategy and marketing/promotions plan, reviewing objectives, target markets, tactics, etc.; Assistance may be available through Parcom/Travel Alberta	Dinosaur Tracks Society Board	Oct-Dec each year	Paid staff, volunteer time, board time
III.5.2. Implement marketing plan initiatives as appropriate, using partnerships with other operators wherever possible; may include production of brochure	Designated members of Society, partners	Ongoing	Paid staff, volunteer time, budget to be determined by plan;

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http://www.nmohwy.com/d/dindismu.htm

Dinamation International Society, Colorado:
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Dinosaur Depot Museum, Utah: http://www.dinosaurdepot.com/

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Dry Mesa Dinosaur Quarry, Utah: http://www.dinosaurweb.com/quarries.htm

Eccles Dinosaur Museum, Utah: http://www.dinosaurpark.org/

Elderhostel: http://www.elderhostel.org/

FAMILYHOSTEL: http://www.learn.unh.edu/familyhostel/

The Great Canadian Fossil Trail Club: http://www.fossiltrail.org/

INTERHOSTEL: http://www.learn.unh.edu/INTERHOSTEL/

Minerva Senior Studies Institute, Grant MacEwan College:
http://www.gmcc.ab.ca/minerv.html

Munchagen-Open Air Dinosaur Museum, Hanover, Germany:
http://strategicnewspapers.com/da/070100/dp0701/foot.htm

Museum of the San Rafael, Utah: http://utahreach.usu.edu/emery/civic/museum/

Norman Wells Fossil Hunt, NWT: http://www.normanwells.com/fossilhunt/

Royal Tyrrell Museum of Palaeontology, Alberta: http://www.tyrrellmuseum.com/

Smithsonian Institute: http://SmithsonianStudyTours.org/sst/uscan/chrono.htm

Steinaker Red Fleet State Parks, Utah: http://parks.state.ut.us/

Town of Grande Cache: http://www.town.grandecache.ab.ca/

T-Rex Discovery Centre, Saskatchewan: http://www.dinocountry.com

Yoho Burgess Shale, British Columbia: http://www.burgess-shale.bc.ca/

World Wildlife Fund (WWF) Travel: http://www.wwf.org/travel/intro.htm

Wyoming Dinosaur Center, Wyoming: http://server1.wyodino.org/

APPENDIX A

INVENTORY OF GRANDE CACHE DINOSAUR TRACKS

I - Site Reference Number: W3 Sites (W3 Bird, W3 Main, W3 Extension and W3 Corner)

Location: Near No.12-Mine haul road

Description of Site: *Tetrapodosaurus borealis* (large quadrupedal [four-footed] dinosaur - ankylosaur), *Irenesauripus mclearni* (large bipedal [two-footed] carnivorous dinosaur - allosaurid), *Columbosauripus ungulatus* (medium bipedal carnivorous dinosaur), *Gypsichnites pascensis* (medium bipedal carnivorous? dinosaur), *Irenichnites gracilis* (small bipedal carnivorous dinosaur - ornithomimid), *Aquatilavipes* ichnospecies (several footprint taxa of avian affinity ranging in size from just over 2 cm to just over 10 cm).

These track sites are continuous along a 600 m long portion of a footwall that in most areas exceeds 50 meters in height. The footprints occur as natural moulds (i.e. they are impressions as opposed to infillings or natural casts) and many lengthy trackway (sequences of footprints made by individuals) are present. The footprints of bipedal animals are dominant over those of the quadrupeds.

Characteristics of Site: The footwall displaying the track sites is at an angle exceeding 60° in some places. The track sites were exposed as a result of surface coal mining operations. There is no significant vegetation in the area between the access road and the footwall. Before backfill and reclamation operations, the base of the original footwall was located over 30 meters below its present level. The site is easily accessed from a main haul road if the access road is maintained. The track sites are less than 150 meters from the point of access and can be reached by walking over the level, but rocky backfill area.

This site has also produced an impressive amount of fossil plant specimens (gingkoes, ferns, conifers, cycads and others) from the talus and backfill material in front of the footwall. It is considered the second best plant fossil location in the mine.

Safety Issues: Depending on whether or not future coal mining operations make use of the main haul road, safety of access may or may not be an issue. If the haul road is used for mining operations then only guided access would be permitted. The greatest safety concern is related to the sites themselves. As they are situated on a tall steep slope, some rockfall is inevitable. Falling rocks can travel quite a distance horizontally in front of the footwall (approximately 40-50 meters). Since the slope is not perfectly vertical, the rocks tend to pick up a bouncing habit that is unpredictable and can be quite dangerous. Tourists should be kept at a safe distance from the footwall, possibly using signs or fencing.

Ranking of Site within Grande Cache Sites in Terms of Tourism Potential: The W3 sites are number one in terms of diversity (number of different footprint types) and number one in terms of viewing potential, but this last quality can vary greatly with lighting conditions. The quality of the footprints is impressive making identification quite accessible to the layperson (with the help of an interpretive key). There are no other track sites known in Canada (and few places in the world) where one can view so many footprints (est. 10,000 for W3 Main alone) at one site.

II - Site Reference Number: W2 Site

Location: Near No. 12-Mine haul road

Description of Site: *Tetrapodosaurus borealis* (large quadrupedal dinosaur - ankylosaur), *Irenesauripus mclearni* (large bipedal carnivorous dinosaur - allosaurid), *Columbosauripus ungulatus* (medium bipedal carnivorous dinosaur), *Gypsichnites pascensis* (medium bipedal carnivorous? dinosaur).

This track site is about 150-200 meters long and about 10-15 meters high. The footprints occur as natural moulds with many lengthy trackways present. The footprints of quadrupedal animals are overwhelmingly dominant over those of the bipeds.

Characteristics of Site: The site is at an angle of approximately 60°. The track sites were exposed as a result of surface coal mining operations. There is no significant vegetation other than grass in the area between the access road and the footwall. Before backfilling and reclamation operations, the base of the original footwall was located over 30 meters below its present level. The site can be accessed by foot from the main haul road near a run out lane. This site is about 200-250 meters from the point of access. A level backfilled and reclaimed area in front of the footwall can be reached by walking over partially unconsolidated and rocky backfill that can contain crevasses and other pitfalls.

This site has produced a large amount of fossil plant specimens (gingkoes, ferns, conifers, cycads and others) in the talus and backfill material in front of the footwall. It is considered the third best plant fossil location in the mine.

Safety Issues: Same as the W3 sites.

Ranking of Site within Grande Cache Sites in Terms of Tourism Potential: The W2 sites rank as number two in terms of diversity and are almost equal to the W3 sites in terms of viewing potential. The quality of the footprints is quite good and individual trackways should be easy for almost anyone to pick out. There are estimated to be over 1500 footprints at this site.

III - Site Reference Number: W1 Sites (W1a and W1b)

Location: Near No. 12-Mine haul road

Description of Site: Exclusively *Tetrapodosaurus borealis* (large quadrupedal dinosaur - ankylosaur). These track sites occur along a 200 m long portion of a footwall that in most areas exceeds 50 meters in height. The footprints occur as natural moulds and some short trackways are present, although the number of footprints is so great and are so intermingled (dinoturbated) that individual trackways are difficult to recognize. There are some *in situ* tree stumps from small to medium size with radiating root systems, but these may be difficult to see from a distance.

Characteristics of Site: The footwall displaying the track sites is at an angle of approximately 60° There is no vegetation as the footwall is right next to a main haul road making this site easily accessibly. There is a site nearby to the southeast where impressions of fallen logs are visible on a high footwall. There are no other significant fossils in the area.

Safety Issues: Same as W3 sites

Ranking of Site within Grande Cache Sites in Terms of Tourism Potential: With only one footprint type visible and they are generally indistinct, ranking these sites the lowest among those under consideration here. They are still interesting to see if viewing conditions are favorable and the "dinoturbation" idea should be quite entertaining to a tour. There are an estimated 300 + footprints.

IV - Site Reference Number: 9 Mine (Lower East Limb Pit)

Location: Near the No. 9-Mine haul road.

Description of Site: Exclusively *Tetrapodosaurus borealis* (large quadrupedal dinosaur - ankylosaur). This relatively small track site is only about 25-35 meters across and perhaps 20 meters high. Its most notable feature is a single *T. borealis* trackway that was excavated by staff of the Royal Tyrrell Museum of Palaeontology in the early 1990's. While there are a few other *T. borealis* trackways present, they are not visible under any but the most favorable lighting conditions. The footprints occur as natural moulds and there are some *in situ* tree stumps present as well.

Characteristics of Site: The footwall displaying the track sites is at an angle of approximately 40°. There is no vegetation and the footwall is right next to the corner of a main haul road making this site easily accessibly. Further up the road towards the 9-Mine Extension sites and Center Limb Pit, there is an area in the ditch where a scientifically important bivalve layer is exposed. The bivalves belong to the genus *Murraya* sp. that has only been found in surface exposures here and in Ft. McMurray. The shells are dark grey and some annual rings are evident, but they crumble apart easily.

Safety Issues: The footwall here is not very steep (40°) so there is little danger from rockfall. The only real trouble that a person could get into is if they walk up the footwall surface itself (it is relatively easy to walk up, but at this angle it can be pretty scary to walk down again).

Ranking of Site within Grande Cache Sites in Terms of Tourism Potential: This is one of the first track sites discovered in this area and it was largely excavated with considerable skill and effort by Tyrrell staff. The single trackway is quite visible and is quite striking. It ranks as number three in the track sites under consideration here. There are approximately 100 or more footprints here.

V - Site Reference Number: Center Limb Pit

Location: Near the No. 9-Mine haul road

Description of Site: Exclusively *Tetrapodosaurus borealis* (large quadrupedal dinosaur - ankylosaur). This track site is fairly small although it is located in very impressive surroundings (on the side of an excavated anticline fold axis). There are only a few short trackways present and the footprints are natural moulds.

Characteristics of Site: The footwall displaying the track sites is at nearly a 90° angle. There is no vegetation. This site is very accessible from the main 9-Mine haul road. The most impressive feature of this site is not the footprints but the excavated anticline whose long fold axis leads to a high wall with very visible layers of folded strata. The limbs of the fold axis plunge on each side into deep pools of water and are very picturesque.

Safety Issues: The footwall here is very steep (90°) so there is danger from rockfall. Another added danger is the presence of deep pools on either side of the fold axis, bordered by steep rock faces of considerable height. Anyone falling in would be very difficult to rescue.

Ranking of Site within Grande Cache Sites in Terms of Tourism Potential: This is a recently discovered track site and its' most impressive feature is the surrounding geology rather than the footprints. As a footprint site it would be ranked last in the sites under consideration here. There are less than one hundred footprints at this site.

OTHER TRACK SITES (NOT UNDER CONSIDERATION)

South Pit Lake Site: Too dangerous because of steep slopes and a large water-filled pit. This site is also too little known at this time and may be palaeontologically sensitive.

8 Mine: This site is too remote and the few footprints it has are faint and not very impressive.

W1c: There are few footprints and inconvenient access, but it is visible from the No. 12-Mine haul road

E2 Pit: This site failed in the mid-1990s and is still an unstable slope. It is of some interest because the failure occurred during a National Geographic film shoot.

12 Mine South, A-Pit N: The slope containing the footprints failed in the summer of 1998. The remaining footwall was covered with backfill to a depth of 60 meters. This area contains some of the best fossil plant material in the mine site, but due to the presence of several steep cliffs and possibility of sinkholes in the backfill area it should not be frequented by tourists.

Mine Dump: This site is too remote and too dangerous.

9 Mine Extension a and **b,** and **9 Mine West Extension Fold Axis:** These sites are too remote and hard to see, but there is a very extensive footwall that is visible from the W3 sites.

APPENDIX B

BEST PRACTICES MATRIX

The following matrix summarizes the results of a survey distributed to similar facilities and sites in Western North America. A total of 18 completed responses were received from the 25 sites initially contacted.

The sites include:

Dan O'Laurie Canyon County Museum, Moab, Utah
Dinosaur National Monument, Jensen, Utah
Eccles Dinosaur Park and Museum, Ogden, Utah
Mill Canyon Fossil Trail and Copper Ridge Dinosaur Tracks, Grand County, Utah
Museum of the San Rafael, Castle Dale, Utah
Steinaker/Red Fleet State Parks, Vernal, Utah
Utah Field House of Natural History, Vernal, Utah
Dinosaur Depot Museum, Canon City, Colorado
Dinosaur Ridge Visitor Center, Morrison, Colorado
Dry Mesa Dinosaur Quarry, Delta, Colorado
Red Gulch Dinosaur Track site, Central Big Horn County, Wyoming
Wyoming Dinosaur Centre, Thermopolis, Wyoming
T-Rex Discovery Centre, Eastend, Saskatchewan
Yoho-Burgess Shale Foundation, Yoho, British Columbia
Calgary Zoo, Calgary, Alberta
Devil's Coulee Dinosaur Heritage Museum, Warner, Alberta
Dinosaur Provincial Park, Patricia, Alberta
Royal Tyrrell Museum of Palaeontology, Drumheller, Alberta

Facility and/or Site Name	Dan O'Laurie Museum	Dinosaur National Monument	Eccles Dinosaur Museum
General Background			
Location	Moab, Utah	Jensen, Utah	Ogden, Utah
Resource presented	Anatosaurus Track, Three Toed Track (possibly Allosaurus), fossilized fish, cycad, birch leaves, fern trunk, dinosaur femur	The dinosaur Quarry VIC contains a book store, exhibits, palaeo laboratory and 1000+ dinosaur bones	8 acres of landscaped park with life sized dinosaurs. Indoors- small exhibit area, a classroom for 35 people and Dinosaur Laboratory. Currently are building a 16,000 ft^2 museum
Type of experience	Museum	View dinosaur bones as they were deposited 150million years ago, touch bones, learn new information	Self-guided tours, formal classroom educational presentations, playground, concession stand
Structures on/offsite	Museum	Onsite- large Visitor's Centre	Onsite (2 buildings- 2000ft2 and 1200ft2)
Tours or activity type programs? Where? What type?	No	Yes- onsite, both guided and self-guided	Yes- both guided and self-guided onsite
Tours operated by site managers/outside contractors		Site managers	Site managers
Entrance fee(s)	No but we like donations	Yes- only in the summer	Yes
Amount		$10	Adults $3.50- Seniors $2.50-Children $2.00- Under 3 free- Groups of 15+$1.50 each
Length of visitor experience		1 hour	2 hours
Season of operation		May to October but open year-round	April to October
Resource is publicly or privately owned or both	Private	Public	Public
Site/facility is managed by	Non-profit	Public	Public (public facilities owned by city)
Site opened when?	1958	1958	1994
Initial funding provided by?	Local community and Non-profit organization	Public	Non-profit organization formed to obtain private and corporate funds to build
Self-sustaining through entrance fees?	No	No	Yes

Facility and/or Site Name	Dan O'Laurie Museum	Dinosaur National Monument	Eccles Dinosaur Museum
Other funding sources	County Government, dues and donations	State Government and gift shop	Gift shop
What is most successful?	Interactive displays and static displays	Touching bones, exhibits, book store, VC talks, viewing work in paleo lab.	In addition to life sized prehistoric models (of Variable quality), have dinosaur skeletons (cast) indoors, along with real fossils. Public is also interested in native vegetation and animals
Visitor use and characteristics			
Number of visitors in 1999	7,485	250,000	132,000
Number of visitors in 2000	8,527	250,000	134,095
Visitor demographics	No	No	Yes
Group Type?			Primarily school tours (2000: 26,092 participants)
Resource Management			
Legislated protection? Type?	No	Yes- Presidential proclamation establishing monument, states that site is unique and scientifically significant	No
Resource management measures?	No	Yes- patrolling/policing, guided access only, enclosure of the resource, removal of the resource	Yes- fencing, patrolling/policing, boardwalks and/or pathways to limit access, but these have not been totally successful
Protection in response to specific concerns?		Yes- fragile specimens can be damaged by touching	To limit pubic access.
Marketing			
Site is marketed?	Yes- brochures	No	Yes, brochures 150,000 bookmarks with entrance coupons are distributed to schools, billboards, ads in mags and newspaper
Website	http://www.moab-utah.com/danolaurie/museum.html		www.dinosaurpark.org
Cooperative marketing?	No		Yes
Type of partner			Other museums
Average yearly spending on marketing	$1,500		$43,000

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Resource presented	Anatosaurus Track, Three Toed Track (possibly Allosaurus), fossilized fish, cycad, birch leaves, fern trunk, dinosaur femur	The dinosaur Quarry VIC contains a book store, exhibits, palaeo laboratory and 1000+ dinosaur bones	8 acres of landscaped park with life sized dinosaurs. Indoors- small exhibit area, a classroom for 35 people and Dinosaur Laboratory. Currently are building a 16,000 ft^2 museum
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Tours or activity type programs? Where? What type?	No	Yes- onsite, both guided and self-guided	Yes- both guided and self-guided onsite
Tours operated by site managers/outside contractors		Site managers	Site managers
Entrance fee(s)	No but we like donations	Yes- only in the summer	Yes
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Length of visitor experience		1 hour	2 hours
Season of operation		May to October but open year-round	April to October
Resource is publicly or privately owned or both	Private	Public	Public
Site/facility is managed by	Non-profit	Public	Public (public facilities owned by city)
Site opened when?	1958	1958	1994
Initial funding provided by?	Local community and Non-profit organization	Public	Non-profit organization formed to obtain private and corporate funds to build
Self-sustaining through entrance fees?	No	No	Yes

Facility and/or Site Name	Dan O'Laurie Museum	Dinosaur National Monument	Eccles Dinosaur Museum
Other funding sources	County Government, dues and donations	State Government and gift shop	Gift shop
What is most successful?	Interactive displays and static displays	Touching bones, exhibits, book store, VC talks, viewing work in paleo lab.	in addition to life sized prehistoric models (of Variable quality), have dinosaur skeletons (cast) indoors, along with real fossils. Public is also interested in native vegetation and animals
Visitor use and characteristics			
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Number of visitors in 2000	8,527	250,000	134,095
Visitor demographics	No	No	Yes
Group Type?			Primarily school tours (2000: 26,092 participants)
Resource Management			
Legislated protection? Type?	No	Yes- Presidential proclamation establishing monument, states that site is unique and scientifically significant	No
Resource management measures?	No	Yes- patrolling/policing, guided access only, enclosure of the resource, removal of the resource	Yes- fencing, patrolling/policing, boardwalks and/or pathways to limit access, but these have not been totally successful
Protection in response to specific concerns?		Yes- fragile specimens can be damaged by touching	To limit pubic access
Marketing			
Site is marketed?	Yes- brochures	No	Yes, brochures 150,000 bookmarks with entrance coupons are distributed to schools, billboards, ads in mags and newspaper
Website	http://www.moab-utah.com/danolaurie/museum.html		www.dinosaurpark.org
Cooperative marketing?	No		Yes
Type of partner			Other museums
Average yearly spending on marketing	$1,500		$43,000

Facility and/or Site Name	Mill Canyon Fossil Trail and Copper Ridge Dinosaur Tracks	Museum of the San Rafael	Steinaker Red Fleet State Parks
General Background			
Location	Grand County, Utah	Castle Dale, Utah	Vernal, Utah
Resource presented	Sauropod Dino tracks; nearby theropod tracks; fossil bones in matrix of stone; both sites are on gentle slopes or low hill sides	Depicts the history and pre-history of Emery County. A replica of a fossilized dinosaur egg believed to contain an embryo a large piece of dinosaur bone containing a tumor, the skeletons of allosaurus, chasmosaurus and albertosaurus the great skull of tyrannosaurus rex	A dinosaur trackway in the Navaho formation. The trackway is located within Red Fleet State Park, along the shore of a 780 surface acre reservoir
Type of experience	Trails to view tracks and fossils and interpretive stops and brochure	Museum	There is a marked trail into the trackway site. On the site there are two interpretive signs. We are currently working on a nature trail guide for the trail into the trackway.
Structures on/offsite	Both- kiosks at parking lot; sign posts keyed to brochure on bone trail; interpretive sign near tracks and stone-lined path to them along with brochure	Onsite	Onsite. At the trailhead we have a kiosk describing the trail and the tracks, at the trackway there are two interpretive signs. There is also place for the visitors to sign-in and make comments at the trailhead
Tours or activity type programs? Where? What type?	Yes- Self-guided onsite	Yes	No
Tours operated by site managers/outside contractors?	Site managers		
Entrance fee(s)?	No	No	No
Amount		Donation	
Length of visitor experience	15 to 30 minutes	1 hour+	1 to 3 hours depending on how the visitor gets to the site. It is a 1.5 mile hike to the trackway or it can also be reached by boat.
Season of operation	Open year-round	Year-round	The trackway can be reached year-round if the weather and snow depth allows
Resource is publicly or privately owned or both	Public	Public	Public

Facility and/or Site Name	Mill Canyon Fossil Trail and Copper Ridge Dinosaur Tracks	Museum of the San Rafael	Steinaker Red Fleet State Parks
Site/facility is managed by	Public	Non-profit	Public
Site opened when?	1985- bones; 1989- tracks	1993	1985/86. The site has always been open for those individuals that could either boat or swim to it. The marked trail was opened in 1998
Initial funding provided by	Public	Community development and Municipal lease money	Public Agency- the US Bureau of Reclamation and the Utah Division of Parks and Recreation are in Partnership
Self-sustaining through entrance fees?	No	No	No
Other funding sources	Federal Government	Local Government and gift shop	State Government
What is most successful?	Accessibility of trails year round and interpretive stops and brochure at bones; brochure and sign plus accessibility at tracks	Guided tours, interactive displays, signs, trails all enhance the total experience	Most visitors enjoy the hike. It is very scenic but also strenuous. From where one parks to the trackway is a 1.5 mile hike with a 300ft elevation loss. Many people do not like the hike out. Visitors can also swim off the trakway site. On a hot, dry Utah summer's day it can be very enjoyable
Visitor use and characteristics			
Number of visitors in 1999	Copper Ridge- 4388/ Mill Canyon- 6120	10,000	On average we might get 2000 visitors/year
Number of visitors in 2000	Copper Ridge- 6044/ Mill Canyon-6090	8,000 (most visits are May thru September)	
Visitor demographics	No	No	No
Group Type?		School tours and Seniors	

Facility and/or Site Name	Mill Canyon Fossil Trail and Copper Ridge Dinosaur Tracks	Museum of the San Rafael	Steinaker Red Fleet State Parks
Resource Management			
Legislated protection? Type?	No	No	It is covered under the laws and regulations governing all Utah State Parks
Resource management measures?	Yes- rerouted road with dirt/rock barriers to protect tracks, patrolling/policing, boardwalks and pathways, and the trail and parking at bone site to narrow/confine impacts to vegetation	Policing/patrolling and an alarm system	Yes- policing and patrolling
Protection in response to specific concerns?	Yes- vehicle travel over top of tracks; trails and parking to limit impacts	Yes- safeguarding our artifacts	No
Marketing			
Site is marketed?	Yes-Dinosaur Diamond Group	Yes- brochures, fairs, advertising, local pageant	Yes- brochures
Website		www.ecc.co.com	http://parks.state.ut.us/
Cooperative marketing?	Yes	Yes	Yes
Type of partner	Loose coalition of fed. Gov't, local gov't, museums and private promoters (dinosaur diamond group)	Folk Art Festival and Fair	The Utah state Travel Council and the Dinosaurland Travel Bureau
Average yearly spending on marketing	Unknown	$500.00	$200.00

Facility and/or Site Name	Utah Field House of Natural History	Dinosaur Depot Museum	Dinosaur Ridge VIC
General Background			
Location	Vernal, Utah	Canon City, Colorado	Morrison, Colorado
Resource presented	Exhibits and educational programming of the Uinta Basin and Uinta Mts.	Historic and present fossil sites on public land in Eastern Fremont County. Most importantly Garden Park Fossil Area on BLM land which was one of 3 sites in the Cope/Marsh bone Wars of the 1880's. It is still productive today- new trackway on city scenic drive	Dinosaur Ridge National Landmark Jurassic bones and Cretaceous tracks (over 300)
Type of experience	Museum based; educational; interactive with scientists	Interpretation at the museum and tours to the localities	Self-guided and/or guided tours- (summer-vanosaurus rides to start tours or van rides-touring); summer science camps as well (ages 10-?)
Structures on/offsite	Onsite (museum building)	Museum interprets the history and sites in town and interpretive sites and trails are in the fossil area. Another site is planned at the trackway	17 interpretive sites, 3 observatory sites (stairs/partial shelter)
Tours or activity type programs? Where? What type?	Yes- self-guided onsite	Yes- guided and self-guided (fossil trails) both on and offsite	Yes both guided and self-guided onsite
Tours operated by site managers/outside contractors	Site managers	BLM manages the site, Garden Park Palaeontological Society (GPPS) does the interpretation	Site managers
Entrance fee(s)	Yes	Yes	No entrance fee- but fee for guided tours
Amount	$5/vehicle group (8 persons), $3/individual $2/tour bus individual	Adults $3.00- Seniors and children $1.50- Tours are $2.00 additional	School rate/Guided rate
Length of visitor experience	45 min-1hour	½ hour to ½ day	1½ hours
Season of operation	Year-round (closed Thanksgiving (US), Xmas, New Years Day, and 1 day for carpet cleaning) W:9am-5pm S:8am-9pm	Year-round	Year-round (weather permitting)
Resource is publicly or privately owned or both	Government	Sites are Public and Museum is private	Public
Site/facility is managed by	Non-profit/State of Utah	BLM and city (public) manage sites and Garden Park Palaeontological Society (private) manages the museum	Non-profit
Site opened when?	1948	Museum 1995/ fossil are has been known since the 1870's	For public late 1995

Facility and/or Site Name	Utah Field House of Natural History	Dinosaur Depot Museum	Dinosaur Ridge VIC
Initial funding provided by	State Government	Public Agency- Garden Park Palaeontological Society (GPPS) helped raise community support and grants	Non-profit- both by public and private grants, non-profit donations and in-kind work
Self-sustaining through entrance fees?	No	No	Yes (basics)
Other funding sources	State government and gift shop	Local Government (rent free facilities); Non-profit group; Memberships, gifts in kind, and we have a gift shop at the museum	Non-profit group/friends organization; endowment (we are "building) and very small grants. Gift shop onsite
What is most successful?	Static display, dinosaur gardens, talking/observing scientists in paleo. Preparation Lab	Guided tours, interactive and static displays, signs, trails, except static displays are most effective only with a facilitator	Guided tours, static displays signs, trails, participatory programs
Visitor use and characteristics			
Number of visitors in 1999	79,752	15,873	40,000
Number of visitors in 2000	70,435 busiest May-Aug	15,608	60,000
Visitor demographics	No	Yes	Yes- 1/3 are school classes; 1/3 are international and out of state (tourists) and 1/3 are local
Group Type?		Most are school groups, but GPPS keeps a notebook in which visitors sign with their name, number in party, where they are from and how they heard about us	Pre-school through post doctoral programs
Resource Management			
Legislated protection? Type?	Yes- State Park- must abide by state legislated mandates	Yes- BLM Area of Critical Environmental concern, Colorado Research Natural Area, National Registered Landmark- the tracksite will be a Canon City Protected Palaeontological Site	Yes- Dinosaur Ridge National Natural Landmark

Facility and/or Site Name	Utah Field House of Natural History	Dinosaur Depot Museum	Dinosaur Ridge VIC
Resource management measures?	Yes, fencing, policing/patrolling, guided access only, enclosure of the resource, boardwalks/pathways limiting access, use of resource protection materials, and removal of the resource	Yes- policing/patrolling (part-time by a ranger) and our presence doing field work protects the resource	Yes- fencing, patrolling/policing (sheriff Department- night patrol)
Protection in response to specific concerns?	Yes (theft, security, safety and liability)	Yes- fossil poaching is a large concern and a constant problem. The rangers territory is huge and the Fossil Area is just a tiny part of it.	Yes (prevent climbing on tracks)
Marketing			
Site is marketed?	Yes- brochures and advertising	Yes- brochures and minimal advertising	Yes- brochures, promotions if solicited, travel writers by request
Website	State Parks of Utah	www.dinosaurdepot.com	www.dinoridge.org
Cooperative marketing?	No	Yes	Yes
Type of partner		Chamber of commerce, brochure, other museum and tourism websites	Red Rocks Park
Average yearly spending on marketing	$200	Minimal	Summer camps ($250.00)

Facility and/or Site Name	Dry Mesa Dinosaur Quarry	Red Gulch Dinosaur Tracksite/USDI Bureau of Land Management (BLM)	Wyoming Dinosaur Center
General Background			
Location	Delta, CO	Central Big Horn County, Wyoming, USA	Thermopolis, Wyoming
Resource presented	Large dinosaur quarry in which fossil material is uncovered and removed for preparation/curation	Over 1,100 dinosaur tracks located on the exposed surfaces of the Middle Jurassic Sundance Formation	Some of the largest dinosaur fossil quarries in the world/large Jurassic dinosaurs such as Allosaurus, Apatosaurus, Camarasaurus and Diplodocus. 19 full-size mounted skeletons, including 8 dinosaurs, such as: Allosaurus, Triceratops and Tyrannosaurus Rex. There are displays on geology and prehistoric life on earth.
Type of experience	Tours led by a professional paleontologist, "hands-on" digging for fossils supervised by scientist	The visitor to this remote area is allowed to examine the tracks closely and take photographs. Interpretive materials are provided explaining the discovery of the tracks, their importance in understanding the paleontology and palaeo-geography of the region, and the current scientific results obtained by researchers working with the BLM on the site. A world wide web page offers information about the site in addition to the materials provided on location. These materials include lesson plans for school classes and other educational resources.	Museum related; educational; interactive with scientists. Indoor/outdoor experiences. Hands-on/hands-off
Structures on/offsite	Both- interpretive signs, toilets, work table	Onsite	Both
Tours or activity type programs? Where? What type?	Yes- guided both on and offsite	Yes- both guided and self-guided on and offsite	Yes- Dig for a day/dig site tours/kids dig for a day at site, guided at museum, self-guided. onsite and offsite
Tours operated by site managers/outside contractors	Site managers	Both	Site managers
Entrance fee(s)	Yes	No	Yes
Amount	Tour:$10 Adults/ $5 children (6-17); digs $55 Adults/$5 children (6-17)	We accept donations	**MUSEUM ONLY-** Adults $6.00, Children under 18, Seniors, student & Veterans $3.50 **DIG SITE ONLY** Adult $10.00, Children $7.00 **PACKAGE M & DS** Adult $12.00, Children $8.00 Children under 3 are FREE **Group Rates/School Groups** See attached price list
Length of visitor experience	2 hours	25 to 45 minutes	1½ hours

Facility and/or Site Name	Dry Mesa Dinosaur Quarry	Red Gulch Dinosaur Tracksite/USDI Bureau of Land Management (BLM)	Wyoming Dinosaur Center
Season of operation	June-September	Year-round peak in summer	Year-round
Resource is publicly or privately owned or both	Public	Public	Private
Site/facility is managed by	Public	Public	Private
Site opened when?	1972	1998	1995
Initial funding provided by	Public Agency	Public Agency	Private individual
Self-sustaining through entrance fees?	No	No	No
Other funding sources	Federal Government and a gift shop	Federal Government	Private and gift shop
What is most successful?	Guided tours, opportunity to interact with/observe scientists, field assistants, "hands-on" experience of discovering fossil material	Because we are in the initial phase of development we have not received feedback on the new developments. The guided tours have been very successful.	Guided Tours, participatory programs, observing scientists in action
Visitor use and characteristics			
Number of visitors in 1999	39	20,000	40,000
Number of visitors in 2000	128	18,000	30,000
Visitor demographics	Yes	No	No
Group Type?	95% Caucasian, 2% African American, 2% Asian, 1% Hispanic, 54% adult, 46% children, 85% from within 100 mile radius-48 female, 119 male, average party size is 7 people, 90% family, 10% group tour (all schools)		
Resource Management			
Legislated protection? Type?	Yes- located on national forest land, protected by a number of statutory and regulatory provisions	Yes- area of critical environmental concern	No
Resource management measures?	Removal of the resource and over-burdening if left in situ	Yes- policing/patrolling	Yes-fencing, guided access only (to the dig site), enclosure (in the museum), and the use of resource protection materials
Protection in response to specific concerns?	Yes- fossil theft, damage, vandalism, weathering	Yes- theft and vandalism	No

Facility and/or Site Name	Dry Mesa Dinosaur Quarry	Red Gulch Dinosaur Tracksite/USDI Bureau of Land Management (BLM)	Wyoming Dinosaur Center
Marketing			
Site is marketed?	Yes- brochure and promotions	No	Yes- brochures and advertising
Website	http://www.dinosaurweb.com/quarries.htm		www.wyodino.org
Cooperative marketing?	Yes		Yes
Type of partner	County tourism Cabinet interpretive association, local museum		Chamber of Commerce
Average yearly spending on marketing	$200		$60,000

Facility and/or Site Name	T-Rex Discovery Centre	The Yoho National Park Burgess Shale	The Calgary Zoo- Dinosaur Exhibit
General Background			
Location	Eastend, Sask.	Field BC- Yoho National Park	Calgary, Alberta
Resource presented	Late cretaceous period and early tertiary period	Paleontology, geology, palaeo-ecology, climate change, landscape ecology, world heritage site environmental/resource protection	7 acre park with sculptured granite geological formations, planted environments and 13 large dinosaur models
Type of experience	Hands-on indoor interactive to guided tours to excavation to archaeology/geography and astronomy	An earth science educational guided hike	Interpretive programs and self-guided experience
Structures on/offsite	Both buildings walkways nature trails (on existing animal trails) to active excavation sites with signage	Onsite A signed closed area	Onsite- signs
Tours or activity type programs? Where? What type?	Yes- palaeo resources are guided others are self-guided, both on and offsite	Yes- guided both on and offsite	Yes, both self guided and guided onsite
Tours operated by site managers/outside contractors	Site managers	Outside contractors	Site managers
Entrance fee(s)	Yes	Yes	No
Amount	Adults $5.00- Children $3.00	Adult $45.00 – Children/students $25.00 +GST	
Length of visitor experience	2 hours to one week	10 hours to BS/ 6 hours to Stephen	45 minutes
Season of operation	Year-round	July 1st to end of September	Year-round. Emphasis on May to September
Resource is publicly or privately owned or both	Public (community)	Public	Public
Site/facility is managed by	Non-profit	Non-profit	Non-profit
Site opened when?	1-Jun-00	Parks Canada started the guided hikes in 1981 then we started contracting guided hikes in 1994	1983
Initial funding provided by	Private Individual; private corporation; public agency; non-profit organization; and local community	Non-profit organization	Private corporation; non-profit organization; and local community

Facility and/or Site Name	T-Rex Discovery Centre	The Yoho National Park Burgess Shale	The Calgary Zoo- Dinosaur Exhibit
General Background			
Location	Eastend, Sask.	Field, BC- Yoho National Park	Calgary, Alberta
Self-sustaining through entrance fees?	Border line yes; not off admission and merchandizing, but off two lessees (Royal Sask. Museum and Univ. of Sask.)	Yes	No
Other funding sources	Gift shop		Non-profit group and gift shop
What is most successful?	Hands-on interactive stuff inside and tours to quarries and digs outside	#1 guided tours; #2 group discussions with scientists; #3 highly qualified guides	Signs, trails and displays
Visitor use and characteristics			
Number of visitors in 1999	4500	1147	400,000
Number of visitors in 2000	7000 June- Dec	1275	450,000
Visitor demographics	No	No	No
Group Type?	Everyone loves dinosaurs from preschool to old age		
Resource Management			
Legislated protection? Type?	Yes Excavations under the Heritage Property Act within the province- the Royal Sask. Museum has the permits to do the excavations	Yes National Parks Special Protected Areas- Zone 1 "CLOSED AREA"	No
Resource management measures?	Yes- guided access only, use of existing nature trails, resource protection measures on active excavations only (tarps, box coffins, etc). Had to remove the T-Rex because of weathering Activities are to take place in ONE area only. This was established through an agreement with the land-owner	Yes- fencing, guided access only, enclosure of the resource, Closed signs and video camera surveillance	Yes- fencing, policing/patrolling, guided access only, boardwalks/trails
Protection in response to specific concerns?	No these measures are proactive	Yes (Theft of fossil specimens)	No

Facility and/or Site Name	T-Rex Discovery Centre	The Yoho National Park Burgess Shale	The Calgary Zoo- Dinosaur Exhibit
Site is marketed?	Yes- brochures, promotions with the summer festival "DINO DAYS", we advertise with radio, newspaper and "Scenic Saskatchewan", we sponsor travel writers when coordinated with Sask. Tourism	Yes- brochures	Yes but only as part of the greater Zoo experience. We do have our own brochures, we sponsor travel writers, attend trade shows and hold the zoo gala
Website	www.dinocountry.com	www.burgess-shale.bc.ca	www.calgaryzoo.ab.ca
Cooperative marketing?	Yes	No	Yes
Type of partner	Regional/provincial tourism associations, Cypress, Ft. Walsh and Grasslands- all educational promos, and the Sask. Wetland corporation		Limited activity on "Fossil Trail" Consortium
Average yearly spending on marketing	$6- 8000 definitely paid off, website receives more than 200 hits/day	$1,500	$20,000

Facility and/or Site Name	Devil's Coulee Dinosaur Heritage Museum	Dinosaur Provincial Park	The Royal Tyrrell Museum of Palaeontology
General Background			
Location	Warner, AB	Patricia, AB	Drumheller, AB
Resource presented	Site of Canada's first dinosaur and nests discovery	World's most significant fossil beds from the late Cretaceous Period (~75 million years ago). 38 species of dinosaurs from the Park's 73km2 is a world record for an area of this size	It is a major exhibition and research centre, and one of the largest palaeontological museums in the world, displaying more than 200 dinosaur specimens. There is an indoor garden, museum shop, prep lab, and cafeteria
Type of experience	Hands-on educational programming, interpretive guided tours or museum, interpretive guided tours of egg site	1)visitor's centre/exhibit gallery- 2)Park interpreter led bus tours and hikes into the Park's restricted access Natural Preserve- 3) evening amphitheatre programs (July-Aug)- 4) Five self-guiding trails and 2 outdoor fossil displays	Interactive museum, hands-on educational programming
Structures on/offsite	Both, the egg site (20 miles east of Warner) has signage and displays. The museum (in Warner) has a number of displays	Onsite- Visitors Centre; 2 outdoor fossil displays and; one fossil display in restricted-access natural preserve	Onsite
Tours or activity type programs? Where? What type?	Yes- Guided both on and offsite	Yes- Guided onsite	Yes- guided and self-guided tours of the museum, dig for a day, dig watch, educational programs as well
Tours operated by site managers/outside contractors	Site managers	Site managers	Site managers
Entrance fee(s)	Yes	Yes	Yes
Amount	$3.50 group tours museum/ $5.00 museum and site	$4.50 adult (16+); $2.25/youth (6-15); children under 6 are free	Adults (18 and over) $8.50/ Seniors (65+)$6.50/ Youth (7 to 17) $4.50/ Children (6 and under) FREE/ Family Pass (one or two adults and their children age 7 to 17) $20.00
Length of visitor experience	1 to 2.5 hours museum to museum site	Bus Tours- 1:45 to 2 hours Guided hikes 2.5 hours	2 to 6 hours in the museum, 1 day to 1 week for digs
Season of operation	Group tours available year- round, 7 days/week May-Sept. long weekend	Park is open year round, VIC and bus tours from Victoria Day to Thanksgiving (daily) and the rest of the year 9-5	Open year-round
Resource is publicly or privately owned or both	Public	Public	Public
Site/facility is managed by	Non-profit	Public	Public

Facility and/or Site Name	Devil's Coulee Dinosaur Heritage Museum	Dinosaur Provincial Park	The Royal Tyrrell Museum of Palaeontology
Site opened when?	1995	1955	September 25, 1985
Initial funding provided by	Public Agency, local community, regional economic committee and Tyrell	Public Agency	Public Agency
Self-sustaining through entrance fees?	Non-profit	No	No
Other funding sources	Local government, provincial government, non-profit group, and gift shop	Provincial Government and gift shop	Provincial government, gift shop, various programs, partner involvement in research programs
What is most successful?	Guided tours, interactive displays, observing scientist in action	#1- guided bus tours and hikes to restricted area; #2- evening amphitheatre programs; #3 VIC displays; #4 self-guiding trails	
Visitor use and characteristics			
Number of visitors in 1999	Museum- 1469/ museum and site- 242/ student groups- 243	83,000	1998/99: 383,348
Number of visitors in 2000	1654/653/622 (25 school groups)	85,000	1999/2000: 391,125
Visitor demographics	Somewhat (see above)	No	Origin: 49.6% Alberta, 35.4% Other Canada, 6.1% US, 8.9% overseas. Average party size of 4.32 persons. 37.1% specifically come to visit the site, 21.8% visit as part of long vacation, 18.8% as a short getaway or day trip, 10.8% to show friends or relatives
Group Type?			
Resource Management			
Legislated protection? Type?	Yes- site has designation as a provincial historic site; cooperating society has ministerial agreement with community development	Yes- protected by Alberta Statutes- Provincial Parks Act & Regulations and Historical Resources Act & Regulations	Yes- protected by Alberta Statutes- Provincial Parks Act & Regulations and Historical Resources Act & Regulations
Resource management measures?	Yes, fencing, guided access only, enclosure of the resource	Yes, fencing, patrolling/policing, guided access only, enclosure of the resource, and removal of the resource	Various relative to individual sites in the province. Specimens and casts brought to the museum for research and display
Protection in response to specific concerns?	Yes protection of the site and the resources	Yes -prior to 1970, public had access to all sections of the Park and fossil removal was a problem. In 1970, the restricted access natural preserve was introduced to reduce the loss of palaeo-resources. In 1978 legislation was changed to provide legal protection to fossils	Provide advice and support to various sites in the province.

Facility and/or Site Name	Devil's Coulee Dinosaur Heritage Museum	Dinosaur Provincial Park	The Royal Tyrrell Museum of Palaeontology
Marketing			
Site is marketed?	Yes- brochures, trade shows, and teacher's convention	Yes- brochures and a table top display which is exhibited in Calgary	Yes- brochures, Great Canadian Fossil Trail membership, etc...
Website	Under construction	www.gov.ab.ca/env/parks	www.tyrrellmuseum.com
Cooperative marketing?	Yes	Yes	Yes, for marketing outside the province
Type of partner	Regional tourism groups, Chinook Country tourist zone, AB south DMO	Other fossil sites (e.g. Great Can. Fossil Trail)	Travel Alberta, Calgary Visitor and Convention Bureau, Drumheller Chamber of Commerce
Average yearly spending on marketing	$1,000	Park and Cooperating Assoc. Combined Estimated $4000	$165,000

APPENDIX C
TOURISM TABLES

The following tables are included in this Appendix:

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TABLE C-1:
ACTIVITIES ON TRIP AMONG OVERNIGHT VISITORS TO ALBERTA
BY MAIN PURPOSE OF PLEASURE TRIP

	Canada		United States		Overseas	
	1998 (%)	1999 (%)	1998 (%)	1999 (%)	1998 (%)	1999 (%)
Sightseeing	49	43	86	88	91	90
Visiting Friends/ Relatives	51	52	14	11	34	33
Outdoor Sports/ Activities	58	56	41	39	38	40
Shopping	38	36	78	78	83	82
Parks/Historical sites	31	26	82	81	82	84
Cultural Events	18	13	41	43	51	52
Sports Events	11	13	3	4	8	11
Night Life	10	11	16	15	16	14
Theme Parks	8	7	12	8	21	17
Festivals/Fairs	6	7	6	6	7	10

Source: International Travel Survey and the Canadian Travel Survey; Alberta Economic Development
Note: Percentages do not add up to 100% since multiple answers were allowed.

TABLE C-2: TRIP CHARACTERISTICS OF VISITORS TO ALBERTA, 1999

		Origin						
		Total	Alberta	B.C.	Sask.	Other Canada	U.S.A	Overseas
Total Visits		21,559,000	16,708,000	1,236,000	888,000	653,000	1,230,000	1,441,000
Total Spending ($000,000)		$ 3,764	$ 1,675	$ 304	$ 168	$ 312	$ 656	$ 647
Average Length of Stay in Alberta		3.41	2.42	4.44	3.68	6.98	4.5	6.84
		(%)	(%)	(%)	(%)	(%)	(%)	(%)
Type of Trip	Same-day	45.2	55.1	9.1	17.2	2.9	17.2	4.9
	Overnight	54.8	44.9	90.9	82.8	96.9	82.8	95.1
Purpose of Trip	Visit Friends/ Relatives	19.9	17.3	42.3	37.0	35.5	13.3	17.1
	Pleasure	22.7	18.0	20.3	26.4	35.8	47.9	66.3
	Business	7.4	5.5	16.9	9.8	21.4	13.1	8.8
	Other	4.9	4.1	11.5	9.6	4.3	8.5	2.9

Source: International Travel Survey and the Canadian Travel Survey, Alberta Economic Development

TABLE C – 3:
TRIP CHARACTERISTICS OF VISITORS TO ALBERTA'S NORTH, 1999

		Total
Total Visits		1,530,000
Total Spending ($000,000)		$ 242
		(%)
	Same-day	47.7
	Overnight	52.3
Purpose of Trip	Visit Friends/ Relatives	18.9
	Pleasure	16.0
	Business	8.7
	Other	8.7
Average Length of Stay in Alberta		3.04 days

Source: International Travel Survey and the Canadian Travel Survey, Alberta Economic Development

TABLE C-4:
ATTENDANCE AT ALBERTA CULTURAL FACILITIES AND HISTORIC SITES

SITE	1997/98	1998/99	1999/00
Brooks Aqueduct	2,436	3,773	3,395
Cochrane Ranche	21,228	15,387	23,884
Father Lacombe Chapel	3,848	3,867	3,688
Fort George / Buckingham House	1,789	1,836	1,877
Frank Slide Visitor Centre	45,803	50,015	52,883
Ft. McMurray Oil Sands Discovery Centre	26,253	25,517	23,769
Head-Smashed-In Buffalo Jump	94,397	100,454	95,056
Historic Dunvegan	11,957	14,752	12,624
Leitch Collieries	5,714	5,482	8,984
Remington-Alberta Carriage Centre	32,085	34,165	29,759
Reynolds-Alberta Museum	62,250	53,887	51,226
Rutherford House	26,847	27,337	27,000
Stephansson House	5,552	5,568	5,628
Ukrainian Cultural Heritage Village	45,914	50,049	55,141
Victoria Settlement	2,926	2,685	2,565
Provincial Museum	188,338	232,127	198,919
Royal Tyrrell Museum of Paleontology	361,249	383,348	391,125
Tyrrell Field Station	32,387	41,355	40,416
Total Visitation	970,973	1,051,604	1,027,939

Source: Cultural Facilities and Historical Resources Divisions, Alberta Community Development

TABLE C-5: PROFILE OF VISITORS TO SELECTED ALBERTA HISTORIC SITES AND MUSEUMS, 2000

		Frank Slide Visitor Centre	Ft. McMurray Oil Sands Discovery Centre	Head-Smashed-In Buffalo Jump	Leitch Collieries	Reynolds-Alberta Museum	Provincial Museum	Royal Tyrrell Museum of Paleontology	Tyrrell Field Station
Total Visitation		904	317	1,485	169	786	2,223	7,164	476
Average Travel Party Size		3.77	3.24	3.77	3.18	3.92	3.46	4.32	3.83
Average number of nights away from home in Alberta		4.67	6.31	5.42	3.21	2.97	6.53	5.58	6.40
Mean Spending per party per day		59.51	62.05	65.23	63.70	66.93	48.10	69.24	57.47
Mean Spending per person per day		19.47	23.24	19.86	26.14	20.49	16.26	18.27	17.19
		%	%	%	%	%	%	%	%
Season of Travel	Summer	72.5	56.5	77.3	100	72.5	39.3	76.8	100
	Winter	27.5	43.5	22.7	0	27.5	60.7	23.2	0
Origin	Alberta	53.2	72.7	39.3	60.8	78.9	83.3	49.6	30.0
	Other Canada	29.3	19.5	30.4	27.7	15.9	12.2	35.4	55.2
	USA	5.9	5.0	16.2	9.7	1.5	1.8	6.1	7.0
	Overseas	11.5	2.8	14.1	1.9	3.6	2.7	8.9	7.8
Party Composition	Children <18 alone	1.2	1.1	2.[illegible]	0.0	0.9	4.6	0.8	0.8
	Young Family	0.1	0	[illegible].2	0.0	0.2	0.3	0.1	0.2
	Older Family	3.4	3.5	3.8	7.4	9.5	21.6	12.0	10.1
	Mixed Family	16.7	8.8	18.3	18.6	14.4	17.0	14.1	18.7
	Grandparents & Grandchildren	13.3	9.3	8.3	7.5	5.7	10.7	17.7	12.1
	Three Generations	3.4	4.7	3.4	3.8	3.8	4.6	3.2	1.1
	Younger Adults	9.3	8.4	10.8	8.1	15.0	12.2	16.8	14.5
	Mature Adults	23.1	21.7	16.8	25.2	11.7	12.2	15.1	22.1
	Mature Adults & Seniors	19.1	22.6	22.4	24.8	24.2	10.8	11.8	15.5
	Mixed Adults	10.5	19.8	13.6	4.5	14.4	6.0	8.5	4.9

TABLE C-5: PROFILE OF VISITORS TO SELECTED ALBERTA HISTORIC SITES AND MUSEUMS, 2000 (Continued)

		Frank Slide Visitor Centre (%)	Ft. McMurray Oil Sands Discovery Centre (%)	Head-Smashed-In Buffalo Jump (%)	Leitch Collieries (%)	Reynolds-Alberta Museum (%)	Provincial Museum (%)	Royal Tyrrell Museum of Paleontology (%)	Tyrrell Field Station (%)
Main Purpose of Trip to the Area	No Response	0	0	0	0	2.0	0.3	0.3	0.8
	Business/ meeting etc	1.9	19.7	1.4	3.1	1.7	9.7	1.3	0.8
	Personal Errands	0.6	0.4	0.4	1.5	0.9	13.4	0.5	0.0
	VFR	12.7	35.5	11.3	17.3	13.8	29.3	8.5	9.0
	Show Friends/ relatives around	11.4	6.2	8.1	7.6	11.7	2.0	10.8	5.7
	Long Vacation Trip	30.3	1.6	32.3	28.3	3.4	16.9	21.6	36.4
	Short Getaway trip	22.2	13.5	16.9	20.4	23.6	16.5	18.8	16.0
	To Visit Facility or see event	7.2	20.8	24.3	2.0	46.2	12.2	37.1	26.4
	Just passing through	13.5	2.2	9.8	23.2	3.8	2.6	1.3	7.7
	Other	2.8	5.1	2.4	0.8	1.2	2.5	1.1	2.3
Information that encouraged you to visit site	No Response	0	5.0	0.2	0.0	0.1	1.2	0.1	0.3
	Newspaper Ad	0.1	2.6	1.6	0.8	7.6	12.3	1.5	2.7
	Magazine Ad	1.5	1.4	3.4	1.2	4.3	1.9	2.3	0.8
	Radio Ad	0.1	2.2	0.4	0.0	5.0	5.6	0.2	0.0
	TV Ad	0.5	7.9	0.2	0.0	12.8	7.5	1.0	1.9
	Internet	2.2	0.5	4.9	1.0	1.3	1.9	9.2	11.1
	Event Calendar	0.4	3.9	0.1	0.0	2.2	3.7	0.4	1.6
	Travel Guide	16.4	14.2	29.2	17.8	8.1	9.9	17.3	30.0
	Books/articles	2.2	1.5	3.4	1.1	2.5	0.4	4.1	9.8
	Billboard	2.7	3.1	2.1	2.2	2.1	2.7	0.1	0.7
	Road Sign	17.3	13.1	9.6	48.8	4.5	4.9	1.5	3.3
	VIC	6.3	9.4	8.6	4.7	2.0	1.8	5.2	8.8
	Someone in area	7.7	17.3	6.3	4.9	6.3	4.7	5.2	5.2
	School	5.8	0.7	3.7	0.0	1.0	2.5	2.4	1.7
	Friends/ relatives	26.2	33.6	35.1	12.8	31.1	25.2	31.6	31.9

TABLE C-5: PROFILE OF VISITORS TO SELECTED ALBERTA HISTORIC SITES AND MUSEUMS, 2000 (Continued)

		Frank Slide Visitor Centre (%)	Ft. McMurray Oil Sands Discovery Centre (%)	Head-Smashed-In Buffalo Jump (%)	Leitch Collieries (%)	Reynolds-Alberta Museum (%)	Provincial Museum (%)	Royal Tyrrell Museum of Paleontology (%)	Tyrrell Field Station (%)
Information that encouraged you to visit site (continued)	Personal experience	33.6	10.8	17.4	16.3	32.6	38.8	40.3	22.7
	Other	1.0	3.6	1.4	0.8	4.8	2.6	1.6	0.9
	Other Sites	0.0	0.2	0.0	0.0	0.0	0.0	0.1	1.6
	TV	0.0	0.0	0.2	0.0	0.5	0.2	0.7	0.0
	Pass/Coupon Book	0.3	0.2	0.0	2.0	0.3	0.1	0.0	0.0
First Visit to Facilities	Yes	69.1	67.0	77.5	78.2	60.7	28.5	55.6	75.5
	No	30.4	33.0	22.3	21.8	38.6	71.2	42.7	24.5
Time Spent at Facility	Up to 0.5 Hr	1.3	1.5	0	23.3	0	0.1	0	1.0
	0.5 to 1 Hr	32.4	16.3	10.7	54.6	1.2	8.2	1.2	17.6
	1 to 1.5 Hr	15.8	13.2	14.9	8.9	3.2	11.1	3.0	3.2
	1.5 to 2 Hr	35.3	43.8	37.3	9.2	15.8	38.6	24.2	24.0
	2 to 2.5 Hr	4.7	7.4	10.7	1.2	5.3	9.3	8.9	3.6
	2.5 to 3 Hr	7.2	6.3	18.2	0	20.3	21.1	24.3	12.0
	3 to 4 Hr	2.1	4.3	5.8	0.3	24.4	10.3	19.7	16.5
	4 to 5 Hr	0.1	3.2	0.7	0	13.8	0.9	8.8	7.5
	5 to 6 Hr	0.3	1.3	0.2	2.0	9.1	0.1	6.1	4.0
	6 to 8 Hr	0.1	0.6	1.1	0.4	5.4	0	2.0	3.6
	Over 8 Hr	0	0.5	0.1	0	0.3	0.1	0.4	6.7

Source: Heritage Facilities Visitor Survey, Full Year 2000, Infact Research for Alberta Community Development, Cultural Facilities & Historic Resources Division

TABLE C-6:
ROYAL TYRRELL MUSEUM DAILY ATTENDANCE 1999-2000

	Adults	Seniors	Children	Totals
April	9938	1068	18811	18811
May	16405	10267	28880	28880
June	23463	13710	41903	41903
July	63462	45182	118216	118213
August	57136	39799	103785	103785
September	19871	6371	30537	30537
October	9440	6088	15936	15936
November	4042	2542	6836	6836
December	2978	1431	4632	4632
January	1841	1157	3097	3097
February	3486	2646	6260	6260
March	5966	5891	12211	12211
Total	218028	142152	391101	391101

Source: Royal Tyrrell Museum of Palaeontology statistics

TABLE C - 7:
ROYAL TYRRELL MUSEUM DAILY ATTENDANCE 2000-2001

	Adults	Seniors	Children	Totals
April	10095	805	8178	19078
May	15758	2018	11419	29195
June	23224	4417	14135	41776
July	60690	8706	43376	122772
August	56843	6644	39270	102757
September	20492	4073	7004	31569
October	10207	1601	4730	16528
November	3681	274	2473	6428
December	1960	113	1120	3193
January		185	1552	4537
February				
March				
Total	205750	28836	133257	367834

Source: Royal Tyrrell Museum of Palaeontology; Note: Statistics not available for full year.

TABLE C – 8: PERCENT OF VISITS TO GRANDE CACHE
BY TYPE OF TOURISM BUSINESSES AND SEASON

	Accommodation (%)	Outdoor Adventure (%)
January to March	19	0
April to June	22	27
July to September	38	72
October to December	21	1

Source: Town of Grande Cache: Tourism Development and Retiree Attraction Strategy; Ference Weicker & Company; September 2000, Pg 92

TABLE C - 9: REASON FOR VISIT TO GRANDE CACHE

Reason for Visit	Accommodation (%)	Adventure (%)
Traveling through by automobile	16	19
Visiting friends and relatives	5	10
Traveling to the Grande Cache area on business	76	3
Visiting Grande Cache as their primary destination	3	68
Total	100	100

Source: Town of Grande Cache: Tourism Development and Retiree Attraction Strategy; Ference Weicker & Company; September 2000. Pg 92

TABLE C - 10: REVENUE BASED ON CUSTOMER ORGIN (GRANDE CACHE)

Customer Origin	Accommodation (%)	Outdoor Adventure (%)	Other (%)
Right in the Grande Cache Area	23	6	62
In the rest of Alberta	62	43	24
The rest of Canada	11	27	10
The United States	2	16	1
Other countries	2	8	3
Total	100	100	100

Source: Town of Grande Cache: Tourism Development and Retiree Attraction Strategy; Ference Weicker & Company; September 2000. Pg 93

TABLE C - 11: PURPOSE OF TRIP TO GRANDE CACHE FOR CANADIANS

Purpose of Trip	Respondents	Percent (%)
Traveling to or from Alaska	4	6.6
Traveling to or from other regions	30	49.2
Participating in a circle tour	9	14.8
Visiting friends/relatives in Grande Cache	10	16.4
Traveling to Grande Cache on business	3	4.9
Visiting Grande Cache as the principal destination	4	6.6
Other	1	1.6
Total	61	100

Source: Town of Grande Cache: Tourism Development and Retiree Attraction Strategy; Ference Weicker & Company; September 2000. Pg 98

TABLE C – 12: OVERNIGHTING LOCACTION BEFORE AND AFTER GRANDE CACHE

Centre	Stayed on the way to Grande Cache	Stayed the night after Grande Cache	Distance from Grande Cache (km)
Banff/Lake Louise	10	10	443
Jasper	10	7	214
Dawson Creek	9	15	322
Fort St. John	10	4	401
Calgary	1	2	626
Ft. Nelson	0	1	789

Source: Town of Grande Cache: Tourism Development and Retiree Attraction Strategy; Ference Weicker & Company; September 2000. Pg 117

TABLE C – 13: NUMBER OF PROPERTIES AND AVERAGE ANNUAL HOTEL OCCUPANCY BY REGION AND CITY (1997 – 1999)

REGION/ CITY	1997		1998		1999	
	# PROPERTIES	AVERAGE OCCUPANCY	# PROPERTIES	AVERAGE OCCUPANCY	# PROPERTIES	AVERAGE OCCUPANCY
Alberta's North	38	72.8%	40	67.7%	41	64.8%
Alberta's Heartland	123	72.9%	134	62.6%	110	64.4%
Edmonton & Area	57	67.9%	61	66.5%	64	64.8%
Alberta's Rockies	69	69.5%	54	68.8%	57	71.1%
Calgary & Area	39	75.6%	41	75.6%	46	67.9%
Alberta's South	78	66.5%	78	64.6%	59	64.2%
Banff	32	73.3%	15	75.4%	26	76.8%
Calgary	32	75.8%	33	75.9%	43	68.0%
Canmore	14	62.0%	14	59.4%	13	61.6%
Edmonton	43	68.4%	44	67.1%	49	64.8%
Hinton			11	60.8%	12	61.9%
Jasper	19	62.5%	18	65.7%	18	66.2%
Lethbridge	11	64.9%	11	66.9%		
Medicine Hat	12	68.9%	11	74.0%		
Red Deer	10	67.0%			11	68.7%
TOTAL ALBERTA	404	70.9%	408	67.5%	404	66.4%

Source: Alberta Economic Development: Alberta Accommodation Statistics 1997; March 2000, AB Accommodation Statistics 1998; December 2000. AB Accommodation Statistics 1999
Note: Region names reflect names in place when statistics compiled.

TABLE C – 14: SOURCE OF ROOM DEMAND BY REGION AND CITY, 1997

Region/City	Industrial Crews	Business Travelers	Tourists	Tour Groups	Convention Groups	Other
Alberta's North	36.7%	40.5%	8.8%	3.4%	2.6%	8.1%
Alberta's Heartland	46.4%	24.0%	14.2%	1.2%	3.2%	11.0%
Edmonton & Area	7.9%	37.8%	29.5%	8.0%	7.0%	9.7%
Alberta's Rockies	0.5%	4.1%	39.4%	43.1%	9.4%	3.5%
Calgary and Area	5.3%	52.2%	20.2%	6.8%	9.0%	6.7%
Alberta's South	33.2%	23.9%	25.0%	2.5%	3.8%	11.7%
Banff	0.4%	3.8%	33.4%	48.1%	10.7%	3.7%
Calgary	3.4%	54.3%	20.2%	6.8%	9.2%	6.1%
Canmore	0.4%	5.7%	45.3%	34.4%	11.3%	2.8%
Edmonton	5.7%	38.2%	31.2%	8.8%	7.0%	9.0%
Jasper	0.7%	4.1%	48.6%	38.2%	4.5%	3.8%
Medicine Hat	29.2%	21.9%	26.9%	1.5%	7.3%	13.2%
Red Deer	21.2%	36.2%	16.3%	2.4%	14.0%	9.9%
Total Alberta	18.9%	29.9%	24.1%	12.6%	6.3%	8.1%

Source: Alberta Accommodation Statistics 1997, Alberta Economic Development. January 1999
Note: Region names reflect names in place when statistics compiled.

TABLE C – 15: SOURCE OF ROOM DEMAND BY REGION AND CITY, 1998

Region/City	Industrial Crews	Business Travelers	Tourists	Tour Groups	Convention Groups	Other
Alberta's North	41.1%	40.1%	10.8%	2.7%	2.0%	3.3%
Alberta's Heartland	39.8%	28.0%	12.8%	1.9%	6.3%	11.2%
Edmonton & Area	9.9%	40.5%	25.0%	4.2%	11.3%	9.1%
Alberta's Rockies	1.2%	3.6%	45.1%	40.8%	6.4%	2.8%
Calgary & Area	8.7%	46.5%	20.4%	7.4%	11.0%	6.0%
Alberta's South	25.2%	27.5%	31.8%	3.2%	3.0%	9.3%
Banff	0.4%	4.1%	36.6%	52.3%	5.5%	1.1%
Calgary	6.9%	48.2%	20.0%	7.6%	11.4%	5.9%
Canmore	8.2%	6.5%	52.6%	26.6%	1.3%	4.8%
Edmonton	7.6%	41.1%	25.8%	4.4%	12.4%	8.7%
Hinton	29.2%	21.0%	31.2%	11.1%	3.4%	4.1%
Jasper	0.5%	3.6%	42.0%	40.1%	8.5%	5.3%
Lethbridge	10.0%	45.1%	28.0%	4.4%	4.9%	7.6%
Medicine Hat	21.8%	25.4%	34.6%	3.1%	3.4%	11.7%
Total Alberta	18.9%	31.9%	24.2%	9.8%	7.7%	7.4%

Source: Alberta Economic Development. March 2000, AB Accommodation Statistics 1998
Note: Region names reflect names in place when statistics compiled.

TABLE C – 16: SOURCE OF ROOM DEMAND BY REGION AND CITY, 1999

Region/City	Industrial Crews	Business Travelers	Tourists	Tour Groups	Convention Groups	Other
Alberta's North	40.8%	37.6%	9.3%	1.8%	3.3%	7.1%
Alberta's Heartland	42.6%	24.9%	14.4%	1.6%	4.2%	2.3%
Edmonton & Area	8.7%	43.1%	22.1%	3.7%	12.2%	0.1%
Alberta's Rockies	0.8%	1.9%	39.8%	38.1%	17.7%	1.6%
Calgary & Area	7.3%	42.6%	28.6%	7.1%	9.9%	4.5%
Alberta's South	41.5%	22.6%	24.7%	2.6%	2.5%	6.8%
Banff	0.2%	1.1%	34.2%	43.1%	20.9%	0.5%
Calgary	6.9%	42.9%	28.6%	7.2%	10.1%	4.3%
Canmore	4.5%	5.3%	38.1%	42.0%	4.7%	5.5%
Edmonton	6.2%	44.9%	22.8%	4.2%	13.2%	8.7%
Hinton	34.0%	11.6%	34.5%	11.4%	0.9%	7.5%
Jasper	0.0%	3.7%	53.3%	33.6%	8.8%	0.6%
Red Deer	24.6%	27.9%	16.0%	1.2%	17.7%	12.5%
Total Alberta	18.0%	29.0%	24.9%	11.1%	10.0%	7.0%

Source: Alberta Economic Development. December 2000, AB Accommodation Statistics 1999
Note: Region names reflect names in place when statistics compiled.